





# Professor Gould ducks out of BSA

by Sue Reid  
Professor Julius Gould has refused to appear before the professional ethics committee of the British Sociological Association to discuss the "naming of names" in his controversial report on Marxist influences in higher education.

Instead Professor Gould, professor of sociology at Aberdeen University, this week resigned from the BSA, which he helped to found in the early 1950s.

In his resignation letter to Professor Keith Kelsall, Emeritus Professor at Sheffield University and convenor of the professional ethics committee, Professor Gould maintained: "It would indeed be an extraordinary code of professional ethics which could be invoked to complain about the use of publicly available source material or which made it an offence to indicate that individuals have composed books or articles containing views or statements from which one powerfully and legitimately dissents."

The report, *The Attack on Higher Education: Marxist and Radical*

Penetration, published in September, had, he claimed in the letter, "simply reproduced without comment or amendment certain lists which others had published in 1976 and 1977 and which had already received wide publicity."

"There was nothing unethical about the use of publicly available documents and since this was the sole matter under complaint by the BSA Professor Gould said he was not prepared to meet the committee."

The BSA has expressed deep concern about the use of names and fears that it could lead to blacklisting in universities and colleges.

But in the letter Professor Gould maintained: "It seems to me that if I were to submit myself to the BSA's procedures I would help to set up a serious and undesirable precedent—one which could be used against others and on a much wider basis."

"So far as I am concerned I have no wish to see the Gould report turned into the Gould 'case' and I shall play no part in assisting

those who may wish to effect such a transformation.

The BSA executive have already passed judgment on the report. If they see fit to censure me or otherwise unathetically use more formally, they are at liberty to do so."

There were, claimed Professor Gould, many who had publicly rejected the BSA's claim to be a "professional association" and his decision to decline to take part in "whatever exercise the BSA intended to pursue" would gain support.

"Since this is my carefully considered position, I must now (as a large number of serious and concerned teachers of sociology have already done) disassociate myself from the BSA," the letter concludes.

Professor Kelsall said this week that the BSA was now considering whether to comment on Professor Gould's points. He indicated that the reasons put forward in defence of the report by Professor Gould were unlikely to be considered justified by the association.

# Two occupations called off by students

Students who occupied the administration building at Aberdeen University two weeks ago in protest at the university's investment in companies alleged to have interests in South Africa called off their occupation last week.

The occupation ended after more than 1,200 students attending a union meeting voted overwhelmingly to end the action, which had failed to persuade the university authorities to "disinvest."

At Brunel University, too, students voted to end their occupation after the university's vice-chancellor, Dr S. L. Brugg, attended a union meeting.

The students were demanding that the university should not introduce different fees for home and overseas students.

# £30,000 p.a. for 'Ruskin of North'

The Department of Education and Science has approved the development of the new northern residential college for adults in Barnsley.

The college, which will offer courses from September 1978 is to receive an annual £30,000 grant from the DES.

It will be awarded a grant totalling £23,000 for the 1978-1979 financial year.

The new college, dubbed the "Ruskin of the North", will provide two-year, one-year and 10-week courses for adults.

# Warning of young unemployed backlash to Holland proposals

by Peter David  
Unless there is quick action by the Manpower Services Commission the first phase of its youth opportunities scheme may result in a "backlash" from unemployed young people, Mr Bill Bosden, education secretary of the National Association of Teachers in Further and Higher Education, warned this week.

He said they were already disillusioned. "They want to get a job. Then we inject Holland at considerable expense and with considerable publicity but if it doesn't better equip them to get a job there will be trouble. What they don't want is a general studies course writ large for the good of their souls."

To ensure the value of the courses offered under the Holland programme local education authorities had to know how much money to expect from the MSC.

Mr Bosden warned that many colleges and staff were not well prepared to take on the new type of young unemployed catered for in the scheme. The NATFHE was asking for increased staffing and time for staff to work out new curricular programmes suitable for them.

There should also be time allowances for special training courses for the staff involved, he said.

"We are now concerned that by September next year colleges are prepared for the youngsters and with the right level of staffing to run these programmes."

The MSC is considering transferring the whole of the 16 to 19 age range into a period of education

and training in order to reduce the labour supply.

In a five year plan published this week the commission points out that the expected economic boom is unlikely to reduce the level of unemployment to acceptable levels. It estimates that some 1,340,000 new jobs would have to be created in the economy to reduce registered unemployment to a level of 800,000 in 1981.

Although the report argues that "this is not an impossible task", it concludes that unemployment will remain high relative to past levels. It calls for a study of ways of reducing the labour supply through early retirement, reducing overtime or work sharing.

"A further possibility, and one that is in many ways more attractive because more positive, is to encourage more young people to enter the further and higher education and to expand vocational education and training for adults."

According to the report development of this idea would require an extension of "the present increasingly close cooperation between the education and manpower authorities." But Mr Geoffrey Holland, director of planning at the MSC, made it clear over the weekend that this did not mean expanding the education service.

The commission's report also confirms that discussions are taking place with the Government to merge the Employment Services Agency and the Training Services Agency under "a single manpower services organization."

# Tories claim NUS successes

by Jane Feinmann  
The National Union of Students' executive has adopted a large number of Tory policies over the past six months although most members are left wing, the chairman of the Federation of Conservative Students alleged this week.

Speaking at the federation's southern regional conference in Bournemouth Mr David Wilks said the two Conservatives on the 17 member executive had managed to persuade their colleagues to make seven major reversals of policy.

Among them, Mr Wilks cited the NUS executive decisions to repeal the policy of denying a platform to racist and fascist speakers, to suspend student unions which ban Jewish students, and to reform student union finances.

He said that the FCS had been the only political group to campaign for a reform which would implement a minimum nationally negotiated student union fee. The federation's proposals as to priorities—NUS should concentrate primarily on student issues—had also been largely accepted.

In the past three years, Conservative students "had managed to engineer as dramatic a change in student politics as was seen by the student revolution in the 1960s."

He called on the federation to work for more democratic and representative structures so that a truly representative non-Marxist NUS executive can be elected to serve student needs.

# Mrs Williams to lose some Welsh power

Mrs Williams, Secretary of Education and Science, has accepted her responsibility for the loss of Welsh higher education to the Welsh Government's development policy.

In a parliamentary week the Prime Minister's chief of high non-university education, higher education, public libraries, and education would be transferred to the Secretary of State for Wales.

Mrs Williams will be responsible for the Welsh and Wales, the research and grant and the post-annexation of teachers.

While the transfer of which should come into effect in April, the Welsh Secretary of Education will become responsible for the functions related to which would be vested in Welsh Assembly under a new proposal.

But Mrs Williams, who is expected to continue to be active in the training and teachers, higher education, the work of the validation, adult and continuing education, the supply of highly qualified power.

# Heriot-Watt priority appeal

Lord Thomson of Moultrie, in his installation as Dean of Heriot-Watt University on Saturday, said the university's strong case to make for when restrictions on speaking cases.

"The timing of the Heriot-Watt harder than the work it is doing in the said. He promised staff and students that "it will be a support the principal's view and heard."

Lord Thomson praised the way in which Heriot-Watt had gone in its way "to encourage many of the research projects."

"This university is a geological community in making. The way in which it has applied energies in multidisciplinary collaboration is a small but important lesson which might be placed not only by other universities but also by government."

# Loss of award blame shared

by Bert Lodge  
The Ombudsman has blamed Kingston Polytechnic and University for a former polytechnic student losing her chance of a postgraduate award.

The polytechnic misled a grant application form and the university, after first placing her name on the "possible" list, then on the "certain" list, events informing her from then on, would undoubtedly have received the award.

This was worth £1,657 and the student had to finance herself for the year.

The complainant, a student studies undergraduate at the polytechnic, applied for a Special Research Council grant in 1976-77.

She gave the grant application in the form of a letter to the university for submission to the SSRC by August 1. But it was not forwarded until August 15. As it turned out the research grant was awarded to another student through no fault of her own.

"I conclude there was no obstruction by the polytechnic and this contributed to the complainant's award being offered through no fault of her own. The Ombudsman's report says:

# Applied research gets too much money—Sir Brian

by David Dickson  
Research funding has swung too far towards applied science at the expense of basic research, Professor Sir Brian Flowers, rector of Imperial College, London, has warned.

Sir Brian was speaking in Strasbourg during the annual assembly of the European Science Foundation, shortly after being elected president for a second three-year term.

Many people still believed that it was possible to organize the whole of research according to human need, but it was now being realized that this was not true, Sir Brian said.

"Over the past 10 years we have moved too far in thinking that if you support applied research, that is all which is necessary. But we need to go back a bit and support a little more basic research."

Sir Brian also said that the foundation was concerned about the dangers for European science posed by the increasing concentration of research funds on large-scale facilities.

"This is happening at a time when the total budgets for science are decreasing, and the net result must be a decreasing amount available for small-scale ground scientific activity. If this trend continues, the whole of science would be affected at its origin."

"Of course, it is a very good thing that there are these large facilities—we are not complaining about that. However, the foundation is issuing a warning of some of the long-term problems to which current tendencies could lead."

In its annual report, the foundation says that it has carried out a survey which has revealed that grants to universities, research and independent laboratories, teams and individuals have decreased in recent years in comparison with research funds allocated to institutions created directly by government and under their direct control.

This trend contained symptoms of a dangerous nature, since there was a strong possibility that the advancement of knowledge and new ideas with innovative content have their main origin in the vast number of university teams, as well as in groups in research institutes devoted to less well-established and smaller scale activities.

"The task of maintaining the quality and the liveliness of university groups, which is one of the main functions of ESF members, is much less spectacular, but at least as necessary, as the creation and maintenance of large centres of research."

"If, in addition, research funds for those few who can obtain positions are very limited, a strong negative motivation may emerge in the younger generation towards, in general, and this will result in a diminution of scientific research and in people trained through research", the foundation says.

The ESF also suggests that governments should consider whether grants for basic research in favour of industrial and applied research will not lead to the drying up of the sources of scientific progress, and of training opportunities for sufficient qualified scientists, indispensable for the prosperous development of society in the future.

Redeployment on basic research of only a small proportion of the expenditure now devoted to applied work could remedy the present deficiencies and maintain a sufficient amount of the essential level of international commitments for the support of major scientific facilities, the report says.

During the assembly, it was agreed that the foundation should finance a number of workshops aimed at bringing together young research workers in specially chosen areas, particularly in the humanities and the social sciences.

However, the assembly rejected a suggestion that the foundation establish a centralized fellowship fund to help research workers in movement in projects involving more than one country in Europe.

Instead it was agreed that committees of the ESF might declare areas in which they would like to see fellowships awarded by member organizations, and put forward names of possible candidates.

The assembly also agreed, in the light of a report from an ad hoc committee, to establish a standing committee for the social sciences under the chairmanship of M. Jean-Jacques Salomon, head of the Scientific Policy Directorate at the Organization for Economic Co-operation and Development.

# RMC asks Oakes for more funds

by Peter David  
Senior staff at the London Regional Management Centre have written to the Oakes Committee on the management of higher education in the maintained sector asking for changes in funding.

A submission from Professor Keith Alan-Smith, the centre's director, and Dr Ralph Horwitz, its visiting fellow, claims that the amount of money it has received may be "below a critical minimum" for it to be effective in coordinating the work of the management departments associated with it.

The centre was established last year in association with the South West London College and five inner London polytechnics—City, South Bank, North London, Thames and Central London. Its federal organization is unique among regional management centres and has resulted in the centre receiving only a very small budget of its own.

In their letter to the Oakes committee Professor Alan-Smith and Dr Horwitz say: "As a voluntary association with only such authority as conferred by its constituent members, the LRMC offers special problems in administrative organization and operation. Its budget is a current annual sum of £18,000 only, while the funds available to its members (as departments of management and related studies within polytechnics and other FE institutions funded by the ILEA) are estimated at around £2m."

"There clearly is a major—perhaps insuperable—constraint on the marginal contribution of the LRMC to the aggregate sums now spent on management and related studies (as funded by the ILEA) at a figure of £18,000."

The authors of the letter insist that their submission to the Oakes committee is not a plea for additional financial support.

# Biologists 'do not fear unknown dangers of DNA research'

Most biologists think the potential dangers of recombinant DNA research are negligible, even though strict safety precautions are necessary, a leading scientist has claimed.

The remark was made by Sir John Kendrew, director of the European Molecular Biology Laboratory in Heidelberg, at a public meeting held during the annual assembly of the European Science Foundation in Strasbourg last week.

He said that although recommended methods of containment for such research are similar to those already used for known dangerous pathogens, there were a number of important differences.

First, although the dangers of recombinant pathogens were known, the hazards of recombinant DNA remained hypothetical.

Secondly, many thousands of experiments had been carried out in this field without the appearance, let alone the escape, of any changed organisms that were remotely dangerous. Similarly tests already carried out had shown that the E. coli organisms used in the experiments had become so altered by many generations of culture under laboratory conditions that they were incapable of existing in their normal environment, the human gut.

Finally, Sir John said it was becoming increasingly clear that the kind of changes in organisms that biologists were bringing about in

# OND may get mandatory grant status

by Maggie Richards  
A hint that technical examination courses, such as the Ordinary National Diploma and the Ordinary National Certificate, are likely to receive mandatory grant status shortly has come from Mr Oakes, the Minister of State for Higher Education.

He has also revealed that discussions are to be held later this year between the Business Education Council and the Technical Education Council on the role of part-time courses in higher education.

Mr Oakes was speaking on Monday at a two day conference on industry and education held at the Lancashire College for adult education.

Unemployment, he said, was a worldwide disease which was a tendency to become an epidemic. "In all countries it is the young who are worst hit. This poses social problems, most notably potential disaffection and political alienation."

Answering questions Mr Oakes said he was concerned about the present discretionary grant status of examination courses such as the OND and the ONC.

"It is absurd that somebody can be doing an OND course on a discretionary grant, and have their application for a mandatory grant turned down, while somebody with pretty poor A levels can go and take a degree at the lesser universities and get one."

"We are certainly looking to a Bill during the year to give more mandatory rather than discretionary grants", he said.

Mr Oakes said there had been a tendency over the past 20 years to be more and more concerned with full-time education, which had been encouraged by the method of funding colleges on the basis of full-time places. "There will be discussions with TEC and BEC later this year because there is growing concern about the place of part-time education" he said.

A rift was developing between those people continuing their full-time education and then going into industry and those entering industry straight from school. "The whole prospect of part-time education—not part-time vocational courses—needs examination."

# Two projects study in-service training

Two new research projects investigating the education and training of serving teachers are being sponsored by the Department of Education and Science at a total cost of about £53,000.

A BEA in-service research project will review all full-time and part-time degree programmes.

A project on school based training directed by Dr Ray Bolan, research fellow at the School of Education, University of Bristol, will take two and a half years.

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# ASSOCIATION OF UNIVERSITY TEACHERS

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November 16th 2 p.m.

Central Hall, Westminster

in support of a just pay settlement

# The Gould report

Starting in *The Times* next Monday, Ian Bradley assesses the reaction of academics to the allegations in the Gould report about marxist influence in university and polytechnic courses.



Come to the cookhouse door, boys: a photograph of the cookie lading out stew to men of the 2nd Battalion the Cameronians on exercises near Glasgow just before the First World War. It is in an exhibition of 49 photographs recording over 100 years of Glasgow at war which starts today at Glasgow University Library Exhibition area.

Overseas continued

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Interviews are due to take place in London at the end of November.



# Open learning consortium urged for FE

by Maggie Richards  
A proposal to form a national open learning consortium for further education colleges has been put forward by Mr Richard Freeman, director of the National Extension College at Cambridge.

Mr Freeman made the suggestion to a one-day conference on open learning and further education held at Barnet College of Further Education last Friday. It would act as a central advisory, information and pressure group.

The conference, sponsored by the NEC and Barnet College, was designed to give colleges an opportunity to discuss alternative open learning systems, and to consider the problems of establishing and running such programmes.

Case studies on various open learning methods were outlined at the conference by representatives from Barnet and Colne Open College in Lancashire, and the Rowhison Adult Education Centre in Sheffield.

Mr Freeman said it was not feasible to talk in terms of spending large sums of money or creating a massive Open College on the lines of the Open University. He went on to outline the different roles which a new national consortium or standing conference might fulfil.

There were still reactions of "blank amazement" from many further education establishments, when the adoption of an open learning system was suggested. It was inevitably rejected as impossible until the achievements of other colleges were studied, he said.

Mr Freeman wanted to see information on the operation of these schemes made more readily available through a national consortium. He thought it possible that the group itself might establish research projects and pilot studies.

The consortium could also produce training packs for lecturers using an open learning approach, he suggested. It would provide advice on tutoring, counselling and production of course materials.

Colleges, he thought, could join forces through the consortium to press for more resources to be made available, and their demands would be stronger as a group than as isolated institutions.

# Public criticism will not affect MSC's plans

by Peter Davill

Senior members of the Manpower Services Commission made it clear this week that the commission would not be influenced by public criticism of its plans for the new £168m-a-year training programme for the young unemployed, due to get under way next year.

The MSC's intention to run the schemes with fewer than 30 area boards to cover the whole country has been widely criticized. The Council of Local Education Authorities, the National Association of Teachers in Further and Higher Education and a host of pressure groups have all said the number is too few and their membership too restrictive.

Mr Gerry Fowler, MP for the Wrekin and former minister of state overseeing higher education, told a National Union of Students conference over the weekend that the MSC structure was "a monstrous piece of bureaucracy".

It disregarded entirely the suggestion in the Holland report, on which the programmes are based, that young people should have a say in running their own programmes.

He also criticized the MSC's plans to merge the Employment Services Agency and the Training Services Agency under a single directorate. "Part of the objective there is to make almost impossible a living off of training and a rapprochement of education and training in central government."

But Mr Geoffrey Holland, head of planning at the MSC, told the conference that the commission was determined to involve young people in running the schemes, even if not on the main area boards. He said it would not be right to place involvement at every level, but the commission would try to build up "networks of involvement" at local level, to which some control over resources might be delegated.

Besides writing the MSC report, Mr Holland has been appointed director of the programme to which

it gave birth. He told the students: "I have no intention of presiding over the implementation of programmes that do not include the objectives set out in the original report. I can assure you that they are included in the recommendations which the commission is presenting to the Government."

Mr Richard O'Brien, chairman of the MSC, reacted sharply to allegations that the commission had disregarded the advice of its partners. He said this week: "It is simply untrue that we have failed to take notice of the large number of thoughtful and constructive comments which we have received following the publication of our consultative document, *The Next Steps*, in August. The commission has revised its proposals for the organizations of the new programme in light of the public response to the consultative document."

But he made it clear that the commission would be sticking to the broad outlines of its scheme where area boards would cover groups of local education authorities. Underneath the area boards, however, there would be a "major role for informal local groups to generate ideas and enthusiasm, bring forward ideas for new projects and schemes and provide a direct channel of communication with young people."

He denied reports that the programme would require the recruitment of an extra 700 civil servants. The staff would be drawn from staff already working in the job creation and work experience programmes.

Mr Albert Booth, Secretary of State for Employment, speaking at a work creation conference in London last week, denied there was any suggestion of appointing 700 civil servants to run the youth unemployment programmes.

"In fairness to the MSC, I have to say that the form of control they have proposed is that representation on the area board committees should consist of employers, trade unions, education, youth and voluntary organizations and one member of the MSC," he said.

"I have not yet taken any decision on the proposals but am discussing the matter with a number of interested people."



Members of the London Youth Dance Theatre performing at the Institute of Education, London University, last weekend. The programme is organized by the dance section of the National Association of Teachers in Further and Higher Education.

# Government policies 'have hit quality of college courses' subjects-warning

by Jane Feinmann

Government policies aimed at providing alternative courses for surplus teacher training students have resulted in the validation of a mass of low-standard courses in colleges of higher education, the director of Ealing College of Higher Education said recently.

Mr Reginald Beale, director of Ealing College of Technology, said last week that now courses in the subjects were essential to the country's prosperity. But as a product of the present economic situation their development was from certain.

"Being laboratory based they are more expensive in terms of staff, buildings and equipment," he said. "Consequently even if we had a fairly broad spectrum in the subject, it is obvious that it is essential to start those requiring the least expenditure and to have ready-made those with a greater capital investment and higher running costs."

Mr Beale said the drastic reduction in money spent on Ealing College of Technology had been particularly damaging because of the pressures to the contrary. "The major strength of their educational system."

What can be done to maintain the pluralism of American education? State and federal authorities can take positive and negative steps: supporting the independence of the private sector, delegating the allocation of funds to quasi-independent bodies, differentiating between the functions of state research universities, undergraduate-oriented universities and community colleges and resisting, as vocational in nature.

Mr Beale said the college had been able to introduce new degrees in nursing studies, and others in such areas as economics, mathematics, law and communication studies, but the lack of money had severely restricted any increase in new admissions.

It has often been argued that the pluralism of American education is the major "private" or "independent" universities are neither private nor independent. The first demise of the church-related colleges has also been predicted. For there does remain a relatively healthy and, in research and academic excellence, extremely important independent sector. The stakes are, almost without exception, eager to see this sector flourish; and in recent years they have begun to translate this good will into hard cash.

Increasingly, states are supporting private universities directly or indirectly. Some states, notably New York, spend huge sums on institu-

tion to head America's largest university. Dr Clifton Wharton, President of Michigan State University, is to be the new Chancellor of the State University of New York. This post has been vacant since the former Chancellor, Dr Ernest Boyer, was appointed United States Commissioner of Education. Dr Wharton was the first black

to head a predominantly white institution when he was appointed to Michigan State in 1969. He was chosen from 250 candidates to head the huge and complex New York system, which has 64 campuses, 345,000 students and a budget of nearly \$1,000m a year.

He will have plenty of challenges at SUNY, including a controversial proposal to merge with the City University of New York, strained relations with academics over job reassignment, the prospect of fewer college-age students in the next decade and a power struggle with the state's highest education authority, the Board of Regents, for control over graduate programmes.

Most of these estimates range from 8 to 15 per cent, though some have been as high as 20 per cent. Dr Bowen says the percentages of 8 to 15 are in the same range as the rate of return to ordinary investments. He concludes, therefore: "If investments in higher education produce rates of return comparable to those derived from ordinary investments, when the returns include only monetary earnings, then the total returns to higher education including all the non-monetary benefits must be substantially higher than those earned from ordinary investments. One attempt to measure the rate of return including all the benefits suggests that the return may be well above 22 per cent. Again, higher education appears to pay off handsomely."

The outcome of all this for society is important. The introduction into society of millions of educated people will inevitably modify the social environment, he says. It will influence the prevailing patterns of interests, values, attitudes and behaviours.

"The result may be changes in the birth rate, child care, appreciation of the arts, health, voting behaviour, civic participation and general willingness to seek and accept change. It is no accident that on campus and its alumni have played an important part in the quest for racial equality, the ending of the Vietnam war, the women's movement, consumerism and the environmental movement."

In addition, important social effects of higher education are achieved through research and public service. "The university is the headquarters in our society for basic scientific research which produces an exceptionally high return on investment. Its return—in the form of increased economic productivity, better health, better working conditions—is sufficient alone to compensate for the expenditures on all academic research and public service activities."

From universities also come an increasing number of professors who serve in the Cabinet and in the civil service, who are members of special commissions, sent on political and technical issues by government and business. "American society and higher education probably are both enriched by the frequent interaction between the campus and public affairs," he says, adding cautiously "though the intellectual objectivity of the colleges or university can be compromised and its main business can be neglected through excessive involvement in practical affairs."

Higher education in America is very expensive. It costs \$46,000m a year to operate the colleges and universities and maintain their capital. The extra expenses for more than 11 million students—text books, transportation, living costs, etc.—they give up while they are in college and so on—comes to about \$39,000m. Altogether, Dr Bowen estimates, the grand total is around \$85,000m, or about 5 per cent of the Gross National Product.

It is better spent at some places than others, and so Dr Bowen looked at the different impact of various institutions. He found that the differences in educational impact were less than was commonly supposed, especially when allowance was made for the different backgrounds and abilities of students.

The study asks whether the discrepancy of the value of higher education implies that its expansion should continue. He thinks this could only be justified if successive increments of cost would produce equal or greater increments of benefit. And these would be hard to estimate except intuitively.

Dr Bowen, professor of economics at the Cleveland Graduate School, was helped in his research by Peter Cleck, professor of comparative culture and social sciences at the University of California at Irvine, and by Robert Powell, associate dean for academic affairs at La Verne College, and Gordon Douglas, professor of economics at Pomona College.

The report was supported by a grant from the Alfred P. Sloan Foundation, and issued by the Carnegie Council on Policy Studies in Higher Education. It is available, price \$15, from Jossey-Bass Inc, 615 Montgomery Street, San Francisco, California 94111.



Michael E. Binion, Secretary of Health, Education and Welfare, speaking at the National Press Building, Room 541, Washington DC.

In his final article on diversity in American higher education, our correspondent discusses the deep resistance to "central interference".

# Paying the administrative price of pluralism

An argument used by one of the many people who have written to *The New York Times* about the controversial Bakke case is that Government interference with university admissions policies could lead to a "bureaucratically inspired conformity". A decision by the Supreme Court in Bakke's favour, the correspondent said, "would harm pluralism".

A few weeks ago Mr Joseph Califano, Secretary of Health, Education and Welfare, rejected the idea of any kind of "national" achievement tests because they would limit the right of states to control their own systems of education. He called the proposals now in Congress for a national basic-skills test "a step in precisely the wrong direction". National control of curriculum was a form of national control of ideas.

Within the state sector itself diversity is encouraged by outlining separate functions for various institutions. California's Masterplan, drawn up in 1960, is a leading example. To avoid wasteful duplication and to preserve peaks of excellence, the state designated the minority University of facilities. Massachusetts the elite research institution which was to admit only the top 12.5 per cent of California's students.

The 19 campus State University and Colleges System catered for the broad middle band, and the large two-year community college sector formed the base of the pyramid.

Many other states have since drawn up similar masterplans, and the aim of much recent "rationalization" and centralization of state higher education has been not to produce a group of identical universities but to ensure that the diverse strengths of each institution are properly protected.

At federal level there is a wariness about any concentration of authority—in the Department of Health, Education and Welfare. Semi-independent federal authorities such as the National Science Foundation and the National Endowments for the Arts and for the Humanities have been set up to form policy and allocate funds in their fields. Diversity, it is believed, is best protected and academe best served by the traditional American philosophy of the separation of powers.

Not all forms of diversity are acceptable either to the general public or to education administrators. At primary and secondary level, in particular, diversity is controversial, for it generally means the diversity of wealth spent on schools according to the wealth of a local district and the revenue generated by property tax.

At higher education level, variations in the university systems are of less consequence, and are generally welcomed by teachers and students, who are free to go to systems they find more attractive.

# Alaska tops spending league table

Alaska, America's largest state, continued to spend more per head on higher education last year than any other state. But Rhode Island, the smallest, has boosted its spending in the past two years by more than any other.

The figures appear in the annual chart in the *Chronicle of Higher Education*, which is prepared by Professor M. M. Chambers from the department of educational administration at Illinois State University.

Altogether America's 50 states are spending \$1,525,000m of public money on higher education this year. Appropriations to universities and colleges are one-fifth more than those of 1975-76, and nearly 3.5 times the \$4,500m appropriated 10 years ago.

Allowing for inflation, however, spending has gone up only 6 per cent in the past year.

Rhode Island spent 40 per cent more on higher education this year. But in terms of how much it spent on a fraction of its income, the state is still less than halfway up the list, at twenty-ninth. Over the last 10 years, Alaska has recorded by far the largest increase—643 per cent. Even allowing for inflation, Alaska's appropriations have gone up 294 per cent since 1967.

On average, the 50 states set aside \$71.36 for each person in America's past year, compared with \$59.97 two years ago. Per head, Alaska appropriated \$167.57. Only three other states spent over \$100—Hawaii with \$123.61, Oregon with \$109.96 and Washington State with \$105.27. Bottom of the list was Maine, setting aside only \$42.36.

Looking at the figures in comparison with the relative wealth of the states, however, the list changes. Utah comes top with an appropriation of \$77.83 per \$1,000 of personal income. It is followed by Hawaii with \$71.69 and Mississippi with \$71.50. New Jersey, a notoriously poor spender on all forms of education, came bottom with \$6.29.

New Hampshire, however, whose figures are not yet complete, may well come last in the end. For the past two years this impoverished New England state spent less than any other both in terms of its wealth and per capita appropriations.

Overall, America appropriated \$11.12 for every \$1,000 of personal income. The states high on the list tend to be sparsely populated western states—Wyoming, Idaho, Arizona, North Dakota, New Mexico—and several southern states: Mississippi, North and South Carolina, Alabama. Those spending least as a fraction of their wealth are the old industrial states—Pennsylvania, Ohio, Illinois, New York and states in New England.

These states, in a region of relative economic decline, generally also had the smallest rises in appropriations in the past two years.

College education is associated with better health, with the causation running from education to health, and not the other way. "In fact," Dr Bowen says, "the relation between education and health is so strong that some authorities have suggested that greater returns in the form of public health would be achieved by expanding and deepening education rather than by enlarging the health care system."

Statistical quantification was clearly difficult for Dr Bowen. As he says, his study was made from "the cumulative piling up of thousands of small pieces of evidence". He could not put a neat dollar value to the sum of all the benefits of higher education. But he attempts in his study to give some rough calculations.

On the evidence of damages awarded in lawsuits, he reckons a human life is worth between \$400,000 and \$700,000 today. If it is assumed that all the benefits of college education, neatly described, would improve the average person by 10 per cent, then the benefit would be \$40,000 to \$70,000.

A college education nowadays costs roughly the same amount. "On these assumptions," Dr Bowen says, "college-going pays."

Another approach is that of the many economists who have made estimates of the "rate of return" to investments in higher education. Most of these estimates range

# 'A positive investment for all concerned'

An exhaustive inquiry into going to university argues that the benefits far outweigh any disadvantages.

A college education pays off handsomely. Its economic returns to a country more than offset all the costs. A society's cultural advancement depends on higher education. And the health, wealth and happiness of individuals, their family relationships, and their ability to cope with life's problems, are enormously enhanced by a college education.

These are the main conclusions of one of the most detailed attempts yet undertaken to answer the controversial question: is a university education worth it?

Dr Howard Bowen, a specialist in the economics of higher education, has spent three years analysing the results of hundreds of research studies on the subject. "The evidence leads unmistakably to the conclusion that higher education, taken as a whole, is enormously effective and productive," he says in his study, published last week. His conclusion has been given considerable publicity in view of the steep rise in the cost of higher education, and worry about unemployed graduates and the doubts raised by the phenomenon of the "overeducated American."

By far the most important practical impact of college is on family life. Dr Bowen argues, Hiron, that caution tends to delay the age of marriage and reduce the birth rate. It increases the thought time, energy and money devoted to the rearing of children, and this shows up in child development among the children of college-educated parents as compared with the children of people with less education.

Curiously, Dr Bowen says, the effects of going to university on traditional roles, divorce, remarriage and family relationships have been overlooked. But they are profound. The sexual differences between the sexes in interests and behaviour are narrowed; the divorce rate of college-educated people is slightly lower; and college-educated people spend more time on their children and more money on their education. The effects of college are transmitted down the generations and thus multiplied many times.

Turning to economic productivity and earnings, Dr Bowen says college helps its students by giving them basic skills that are useful in most of life's endeavours—ability to speak and write, knowledge and ability to learn, rationality, tolerance, orientation towards the future, adaptability, and self-confidence.

A college education also helps people function more effectively as consumers and investors, and they get a greater return on their incomes.

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Another approach is that of the many economists who have made estimates of the "rate of return" to investments in higher education. Most of these estimates range

from 8 to 15 per cent, though some have been as high as 20 per cent. Dr Bowen says the percentages of 8 to 15 are in the same range as the rate of return to ordinary investments. He concludes, therefore: "If investments in higher education produce rates of return comparable to those derived from ordinary investments, when the returns include only monetary earnings, then the total returns to higher education including all the non-monetary benefits must be substantially higher than those earned from ordinary investments. One attempt to measure the rate of return including all the benefits suggests that the return may be well above 22 per cent. Again, higher education appears to pay off handsomely."

The outcome of all this for society is important. The introduction into society of millions of educated people will inevitably modify the social environment, he says. It will influence the prevailing patterns of interests, values, attitudes and behaviours.

"The result may be changes in the birth rate, child care, appreciation of the arts, health, voting behaviour, civic participation and general willingness to seek and accept change. It is no accident that on campus and its alumni have played an important part in the quest for racial equality, the ending of the Vietnam war, the women's movement, consumerism and the environmental movement."

In addition, important social effects of higher education are achieved through research and public service. "The university is the headquarters in our society for basic scientific research which produces an exceptionally high return on investment. Its return—in the form of increased economic productivity, better health, better working conditions—is sufficient alone to compensate for the expenditures on all academic research and public service activities."

From universities also come an increasing number of professors who serve in the Cabinet and in the civil service, who are members of special commissions, sent on political and technical issues by government and business. "American society and higher education probably are both enriched by the frequent interaction between the campus and public affairs," he says, adding cautiously "though the intellectual objectivity of the colleges or university can be compromised and its main business can be neglected through excessive involvement in practical affairs."

Higher education in America is very expensive. It costs \$46,000m a year to operate the colleges and universities and maintain their capital. The extra expenses for more than 11 million students—text books, transportation, living costs, etc.—they give up while they are in college and so on—comes to about \$39,000m. Altogether, Dr Bowen estimates, the grand total is around \$85,000m, or about 5 per cent of the Gross National Product.

It is better spent at some places than others, and so Dr Bowen looked at the different impact of various institutions. He found that the differences in educational impact were less than was commonly supposed, especially when allowance was made for the different backgrounds and abilities of students.

The study asks whether the discrepancy of the value of higher education implies that its expansion should continue. He thinks this could only be justified if successive increments of cost would produce equal or greater increments of benefit. And these would be hard to estimate except intuitively.

Dr Bowen, professor of economics at the Cleveland Graduate School, was helped in his research by Peter Cleck, professor of comparative culture and social sciences at the University of California at Irvine, and by Robert Powell, associate dean for academic affairs at La Verne College, and Gordon Douglas, professor of economics at Pomona College.

The report was supported by a grant from the Alfred P. Sloan Foundation, and issued by the Carnegie Council on Policy Studies in Higher Education. It is available, price \$15, from Jossey-Bass Inc, 615 Montgomery Street, San Francisco, California 94111.

The English-Speaking Union

# English Language Competition

The English-Speaking Union wishes to announce the launching of its Language Competition, designed to encourage new ideas in the field of learning and teaching English.

**ELIGIBILITY:** Entries can be accepted only from individuals living, or working in Institutions based, in the United Kingdom.

**ENTRIES:** Entries should describe practical projects which make an original contribution to the improvement of teaching and learning of English, with emphasis on the use of English as a medium of international communication and understanding.

The following areas in the field of language studies are suggested, but the list is not meant to be exhaustive or exclusive: training of teachers; teaching materials; testing techniques; language learning in developing countries; courses in broadening dictionary development; approaches to grammar; audio-visual aids.

**SUBMISSION OF ENTRIES:** Entries must be in the form of a typewritten article of

not more than 3,000 words, prefaced by a summary on one sheet of paper of not more than 300 words.

**DATE OF ENTRY:** Entries should be submitted between 1st March and 30 June 1978. The results will be announced in October, 1978, and the judges' decision will be final.

**AWARDS:** The judges are empowered to recommend up to three awards of £300 and ten commendations worth £50 each. The award winners will receive a medal and those commended a certificate.

Copyright will be retained by the candidate but those who submit suitable entries may be offered commercial backing in order to develop their ideas.

Further information may be obtained from:

Mr D. H. Hicks, MBE BA MBM, Director of Education, The English-Speaking Union, Denmark House, 37 Charles Street, London W1K 3AB

# Offenders' treatment for study

The first systematic attempt by a British authority to evaluate new methods of treating young offenders is now under way at the department of social administration at Lancaster University.

The project will study the effects of intermediate treatment supervision orders on young offenders granted by juvenile courts to local authority social services departments. Intermediate treatment was introduced under the 1969 Children and Young Persons Act for those who might otherwise have been sent to institutions.

Mr David Thorpe, research director and lecturer in social work, said the new method had been introduced because existing young people away had proved largely unsuccessful and shutting young offenders in institutions had a high reconviction rate, stood at well over 75 per cent.

The problem is that orders are being made without any real knowledge of the effects of intermediate treatment on young offenders. Little

# Black chosen to head largest institution

A black is to head America's largest university. Dr Clifton Wharton, President of Michigan State University, is to be the new Chancellor of the State University of New York. This post has been vacant since the former Chancellor, Dr Ernest Boyer, was appointed United States Commissioner of Education. Dr Wharton was the first black

to head a predominantly white institution when he was appointed to Michigan State in 1969. He was chosen from 250 candidates to head the huge and complex New York system, which has 64 campuses, 345,000 students and a budget of nearly \$1,000m a year.

He will have plenty of challenges at SUNY, including a controversial proposal to merge with the City University of New York, strained relations with academics over job reassignment, the prospect of fewer college-age students in the next decade and a power struggle with the state's highest education authority, the Board of Regents, for control over graduate programmes.

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India

# UGC bids for major extension of powers

from A. S. Abraham

BOMBAY

The University Grants Commission may shortly be given the power to recommend to the government the derecognition of a university's degrees if it considers the university in question unable to achieve or maintain high enough standards.

This is only one of a number of recommendations made by a committee set up by the federal government in August, 1974, to review the UGC's work in coordinating and determining higher education standards. The committee, which was required to propose measures to strengthen the Commission, has now submitted its report to the federal education ministry in New Delhi.

Chaired by Dr V. S. Jha, the committee has proposed that the President of India should be the Visitor of all the country's universities and that this is the operative part—the UGC should advise him on all matters concerning university education. The Visitor, that is, in effect, the UGC, should be empowered to issue directives to all universities on the maintenance of standards.

To give the UGC a finger in the school education pie as well, it should, says the committee, have 18 members (it has 12 now), the extra six including experts in secondary, non-formal and higher education. It should be responsible for higher education planning and, to liaise effectively with the Planning Commission (which draws up the country's development plans), the secretary of the latter body should be an ex-officio member of the UGC.

By law, no new university or college should be allowed to be founded except with the UGC's approval. That body should lay down guidelines on the enrolment policy for universities and colleges. It should, too, stipulate norms on the workload for university and college teachers at all levels. These norms should include the number of classroom lectures and tutorials, the amount of internal assessment work and the conduct of research.

The UGC, suggests the Jha committee, should set up panels of experts in different subjects to whom it can advise universities and colleges in these areas. It should have a say in the appointment of university professors and in determining universities to train researches and to run follow-up, in-service courses. It should continuously assess the performance of colleges and have the power either to close down those which are "non-viable" and which duplicate facilities available in the area or to convert them into vocational institutions. It should also be empowered to derecognize colleges which are unable, despite repeated urging, to improve their standards.

From time to time, the committee recommends, the UGC should advise a "reasonably uniform" grant-in-aid system for affiliated colleges throughout the country to ensure

that they have adequate funds. At the same time, it must lay down guidelines and procedures for managing committees to function "in the best interests of colleges".

In cooperation with academic and professional bodies, it must grade colleges and university departments under a "proper system of accreditation". It must also devise a scheme for the annual evaluation of the performance of teachers and such an evaluation must be backed by incentives for good and disincentives for unsatisfactory work.

Finally, the Jha committee recommends the formation of a high-level coordination body comprising the heads of all organizations responsible for one kind of education and research or another (for instance, the Indian Council of Agricultural Research, which is in overall charge of the country's agricultural colleges and universities, or the Atomic Energy Commission).

These bodies are now independent of each other and the subject of establishing such a committee, which the UGC would naturally be represented on, would seem to be to give it at least some say in decision-making in areas which are now totally outside its purview.

The general effect of these wide-ranging proposals, if they are accepted in their present form, will be to increase the UGC's powers vastly, change its nature fundamentally and make higher education centrally directed enterprise with the Commission—whose name the committee would like to see changed, significantly, to the University Education Commission—in overall command.

Such an increase of powers would be the inevitable consequence of the inclusion of education in the Concurrent List as one of among the 59 constitutional amendments rammed through Parliament by Mrs Gandhi's government during the emergency in the shape of the Constitution 42nd Amendment Act.

Such inclusion means that ultimate legislative authority on the subject rests with the federal parliament, not the provincial legislatures. Put bluntly, this means it is the coordinating bodies (like the UGC) becoming more powerful than before.

Even before the constitutional amendments, some amount of federal intervention, influence and control had been permitted in higher education. As a result, the UGC had already been coordinating for years a national coordinating body in effect an arm of the federal government, with which every university had to reckon. But despite this, the central government and the universities within them had a great deal of manoeuvrability in the creation and expansion of universities and affiliated colleges and similar matters. It is this degree of latitude that the present proposals accepted by the government in toto.

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# Greece 17 pc qualify for places

from Sheila Walsh

ATHENS

Some 12,419 Greeks qualified this year for admission to the country's universities. They represent about 17 per cent of the more than 78,000 candidates who sat the entrance examinations.

Another 8,000 students seeking higher education won places in the vocational training, which are being developed and expanded as an alternative to the more traditional university courses. There were 48,000 candidates for places in these training colleges, and most of them also took the examinations for university entrance. The colleges offer specialized courses to qualify students for posts in industry, commerce, agriculture or the social services.

At the universities, the largest number of first-year students, 4,320, went into the schools of engineer-

ing, architecture and the sciences. The five schools of economics took 3,140 students followed by 2,998 to the five law faculties. The nine schools of medicine and pharmacy admitted 1,017 students. The chronically overcrowded universities managed to offer 1,400 more places for first-year students this year, but that was small consolation to the young Greeks who tried and failed in the entrance examinations.

A change from the system of entry to higher education being decided on the basis of a single session of examinations is to go into effect in 1980, under the government's educational reform plan.

By 1980 the first students of the new, more specialized upper secondary schools or lycées will have completed their three-year academic, technical or vocational course. Entrance to the lycées is by competitive examination and candidates for higher education will be judged on the basis of their marks in the last two years of lycée.

Italy

# Left launches 'detente' drive

from Uli Schneider

ROME

Italy's academic year began last week with a call by the Communist Party (PCI) for a new mass student movement to combat campus violence and support university reform within the framework of the party's education policy.

The main objective of the PCI effort seems to be the desire to regroup the student left under a common umbrella and to rekindle a dialogue with students who have been alienated by the party's policy of coexistence with the ruling Christian Democrats.

While hundreds of thousands of students jammed the campuses to enrol last week, the PCI's education talks at Ariccia announced a mass mobilization of secondary and university students throughout the country for mid-November to launch the new initiative labelled "The Movement of 1978".

It said one of the principal aims of the new movement was to halt campus violence by left and right-wing radicals, a phenomenon which has crippled the past academic year.

The Ariccia announcement was quickly interpreted as the PCI's first step towards "detente" with impatient student supporters who had become disillusioned with Government slowness in responding to their demands for more job opportunities, improved educational facilities and greater student participation in the choice of curriculum.

The Communist strategem was announced while in Rome alone the first contingent of an expected 40,000 students crowded the campus to enrol. The final date for enrolment is December 31, a date fixed to allow those now sitting for delayed matriculation examinations a chance to catch the new academic year.

The expected record enrolment at Rome University will add considerable pressure to the existing congestion at an institution considered the world's most crowded with a population of 170,000.

The PCI-sponsored "1978 Movement" will also push for the long overdue university reform Bill, promised since early this year, which envisages two major changes, a diploma after two years of study and an end to the current one-charge system which are to be replaced by a British-style departmental system where professors will be obliged to teach and research.

In addition, there is growing controversy at government and academic level over how to solve the problem of disgruntled graduates now faced with unemployment as the result of the rapid growth of university education.

Student bodies are categorically opposed to the introduction of a "flexible curriculum" but the PCI now for a more flexible view which would take into consideration job opportunities and industrial development without curbing the freedom of choice of professors.

PCI leaders say some of the solution in the politicization of the student masses—a greater consciousness, more contact between economic planning and education.

The current surplus of graduates, a major cause of student unrest, has been brought about by policy introduced 12 years ago which allows those with secondary education to go on to university. The end of last year the university population had increased by 10 per cent and the national association claims as many as two million graduates are now employed or engaged in jobs below their qualifications.

The new wave of university enrolments saw the appointment of 2,500 new professors over the last year but lecture halls remain chronically overcrowded. Efforts to pressure the government to build construction on eight new universities, authorized by the Cabinet, have so far failed. (TIMES, November 4.)

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# France Bill plans increase in paid leave

from Guy Neave

PARIS

A considerable boost to educational leave provision is forecast in a Bill to be laid before the National Assembly in the next few months. Particular emphasis will be laid on helping young people under 20, with special effort to attract school leavers without any vocational qualifications.

Currently, only 2 per cent of the labour force in any one factory may be on educational or training sabbatical at any one time. This, however, is not the main problem. By law, employers are required to pay for only 0.5 per cent of their labour force. The difference, it is thought in some quarters, is one of the reasons why there is considerable reluctance to take advantage of the legislation. The government intends to cover the expenses of the remainder, if funds permit.

The original breakthrough in educational leave came in 1976. Under an agreement, all firms belonging to the French employers' association, the *Confédération nationale du Patronat Français*, and to the national federation of small and medium-sized businesses are required to meet training expenses for those courses lasting no longer than 500 hours. Especially significant was the stipulation of conditions under which workers could follow courses over this limit. In the latter case, employers were required to continue paying the original salary for three months.

As it stands at the moment, the new Bill proposes to extend this to all firms irrespective of whether they belong to the two national organizations or not. The aim is to bring in young people without vocational qualifications or apprenticeships. Much depends, however, on whether Parliament will vote the funds.

# West Germany Regional authorities prepare to ban some student unions

by Günther Kloss

The existence in law of a representative elected student body, the *Allgemeiner Studentenschaftsrat* (ASA), at every West German university and its precise functions are being emerging as one of the most important issues in the relationship between universities and regional governments in the country. The issue is becoming acute in the context of the revision of university legislation by the *Länder* to fulfil their obligations under the new University Framework Law.

Bavaria and Baden-Württemberg are two states which intend to abolish the traditional self-governing students' unions, which are based on compulsory membership and elect from all students. In Baden-Württemberg the old ASA is to be replaced by a "free" student assembly and a student council elected by it. The reason given for this measure is to eliminate the "mixing" of the student bodies' rights and funds by extreme left-wing groups.

The tough new attitude reflects the present strong anti-left mood of many Germans, particularly in the wake of the recent wave of terrorist activity.

It is for this reason that Berlin intends to reintroduce the ASA in the city: it was abolished during the first stage of university reform legislation in 1969. Many other *Länder*, including North Rhine Westfalen and even the CDU-governed Rheinland Palatinate, are to retain a responsible self-governing ASA.

There is little agreement, however, on whether an ASA should be entitled to express an opinion on political issues not immediately connected with student affairs. Many student unions have in fact for many years acted through the courts and have now ruled that they are not entitled to do so.

# Spain Medical faculties open doors after government pressure

from James Connell

BILBAO

After a month of well publicized student protests of aspiring medical students have won their first round in their battle for university places. Previously adamant university medical faculties ceded to government pressure and agreed to absorb the overflow of first-year candidates.

A bleak future is forecast for the 25,000 newly qualified doctors who will be coming on to the saturated job market within the next few years. This figure represents about half the total of all doctors produced annually throughout the country.

As a result of the report submitted by the firm stand and clamped down on first-year entries, alarming warnings for government approval. It was then that the government forced them to back down.

A significant side-effect of the controversy is that the faculties have come to jobs in other areas. Some alarming warnings have emerged.

Madrid, for example, has a university already housed in the national's needs. It is the end of the century. If this student subject at present has a surplus of psychologists for the next 25 years.

# South Africa Medical school for Witwatersrand

The government has sanctioned the establishment of a new medical school by the University of the Witwatersrand. The school will be an adjunct of the new General Hospital and will work in close conjunction with it.

The university is not planning to enrol additional medical students: it now admits 200 students a year and it will continue to do so when the new school is opened.

# On the other hand

No ghost story

It's a dreadful night—the innkeeper said in classic Hollywood traditions, as I set out for Jesus College, Cambridge, to wait for the ghost. Outside the door was again proving that from no matter what height it falls, it can still aim straight down the back of your neck.

I was unwillingly leaving the pub because of a notorious drinking group, the Everlasting Club, formed in the early 1700s. It was so called because among its unnecessarily spooky rules was one to the effect that membership lasted even after death.

On the night of November 2, 1776, the sole surviving club member sat down alone in a room at the top of "Cow Lane", one of the college's oldest staircases, for the annual celebrations. An old man, he took his place amidst six empty chairs reserved for the incorporeal presence of the other members.

That night from 10 pm till midnight there was a "hideous uproar" in the room, after which the sole survivor was found dead. Since then people living in the room have seen or heard the gentlemen and other oddities at this time of year.

So on November 2, 1977, I threaded my way through the torrential Cambridge streets, driven into unaccustomed darkness by a power cut. Entering the gloomy courtyard of Jesus College, I reassured myself with the words of Andrew Mitchell who now lives in the room at the top of "Cow Lane" and is, after all, president of the Conservative Association. "I do not believe in ghosts," he told me over the phone, "but I am having a few friends round on the 2nd just to see if anything happens".

It is just as well he does not because he lives at the top of the creepiest staircase in Western Europe. The steps are wooden and creak. The steep walls are covered in gloomy black and white Tudor paneling. When I arrived, a solitary lamp at the top of the stairs sent down a narrow sliver of light. Through the walls the sound of organ practice in the chapel near by grained unwholly.

I was halfway up the stairs when the lamp went out and all was darkness. Now a rational man would say "power cut" and carry on, but I retraced back down again and out into the pub where I decided this was not after all a story that would interest my readers much, anyway and stayed until closing time.

However, Whitbread and the knowledge that I was staying overnight with a clergyman friend—who could if it came to the worst give me an exorcistic once over before I retired sent me back to hear that "hideous uproar". But when discussion on Tory policies. "No, seriously Laurence," Charles has got a point.

only part was on offer he left, requesting that if the ghost should come he be telephoned in the morning.

Well, it didn't. Midnight came unaccompanied and all lights were duly turned out. The clock struck the traditional number and the lights were put on again. Cambridge rational man had triumphed and poured himself another glass of port.

# Riches of the mind

Those of us who are not all that bright have traditionally consoled ourselves that members of Mensa are people who have not turned their intellectual eminence into worldly success. This consolation has now been removed with a survey carried out by the University of Austin, Texas.

Professor Phillip Powell randomly selected 1,516 Mensa members of whom 61 per cent replied. "The results were startling," he said. "It seems that not only are they clever, but they are also, blast them, rich. More than 40 per cent of the respondents earn in excess of £10,000 a year.

One other finding of interest is that younger Mensa members who attended more informal, radical, child-centred schools thought less of their education and teachers than those who learned only what chalk was, even if not encouraged to do creative writing with it.

It was this older age group, those educated under the present system, of education, who considered their education most satisfactory, made the best social contribution and used their intelligence most positively," Professor Powell found.

There are, of course, many possible reasons, among them nostalgic inaccuracy and the wisdom of years, but the conclusion Professor Powell chooses to draw is that they "bring into question recent educational reforms" which have been introduced largely without any experimental confirmation of their value.

After seven years without a May Ball, King's College, Cambridge, may not be able to refrain any child-centred school during "The college's student union has voted to reinstate the Cambridge whoopee circuit. The more sober-sided and sensible students of 1970 decided that May Balls were rather silly, but the sort of entertainment that King's wished to have was replaced it."

# Whose LSE?

My LSE (Robson Books £5.25) hit the bookshelves last week and successfully repeats the winning formula seen in *My Oxford* and *My Cambridge*. It is full of name dropping about people who have never heard of, endless "formative influences" on my life and thoughts, and "inspired" by the LSE. It is a full-time job just keeping it oiled.

There is a fair amount of sex interest as contributors put their minds to the test. In the LSE, Robert McKenzie's *Swingometer* also recounts how he spent a night in the Three Tuns with an Australian postgraduate who declared, while in his cups, that he had no intention of returning to the family ranch until he had experimented with every form of sexual behaviour known to man". Some of them are outlined and should serve to keep Mr McKenzie's mind occupied during long election nights.

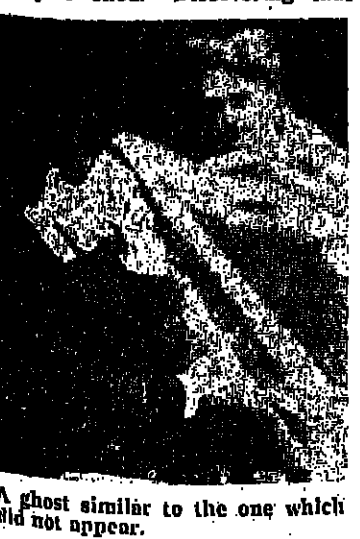
Contributors are also at great pains to discredit the popular view that the LSE is a hot bed of Red dissidence. Unwittingly, B. K. Roberts, the *Teddy Light* commentator in London, gives the simplest proof with an account of the breath-taking nepotism required to get his place there at all.

He had been rejected and was all set to go to Nottingham, when he met the King's personal secretary at a party. "Nottingham?" he exploded. "Nottingham? What? You want to study loco making or something? Why not go to Oxford or Cambridge? Nonsense, nonsense. That William Beveridge sees me a good turn or two. Let me see what I can do."

The book is at its best with the same details that people like to slip about themselves at the time. For example, Aubrey Jones, later chairman of the National Board for Prices and Incomes, apparently spent a lot of time in London with an aunt trying to find lodgings that were not "absolutely foul".

The most uncompromising entry comes from the novelist, Clavin Berners, who starts his contribution: "I hated the place" and continues in that vein for 10 pages.

Knocked on the door three times: slow, heavy treads, ghostly knocks. It came in, cried the voice of Cambridge Rational Man. You do not frighten Conservatives easily. Inside 10 young gentlemen were slipping port, listening to opera and wondering whether to turn the lights out. The most frightening thing in there was a reporter from the *Cambridge Evening News* who told me confidentially that there would probably be a hoax as he had seen something white slumped in the cycle shed. Discovering that



A ghost similar to the one which did not appear.

# Social sciences and developing countries



Ralf Dahrendorf

Undoubtedly, the social sciences, or at any rate social scientists, have already made significant contributions to the understanding and solution of problems of developing countries. In fact, they may well have contributed more in the Third World than in the First World. When it became clear that the new Indian Government would be less concerned with industry than with rural communities, and more particularly with employment in rural areas, social economists went to work to discover the extent and kinds of unemployment.

The sixth plan, which is now being prepared by the planning commission, will benefit from the sophisticated measures of employment in the time budget of village people developed in this process. Elsewhere, in Indonesia, students of population have helped set up a central statistical office and this provide for the first time a basis of information about the human facts of the community which is clearly indispensable for the development of policy.

Nor are socio-economics, demography, statistics the only social science disciplines relevant for development. Even the World Bank has had to recognize by now that it is not enough to provide technical possibilities, but that people have to use them, and that means accept them. It is fine for an international institute to breed hybrids with spectacular yields—but what if farmers refuse to buy new seeds every year? Anthropology, or at least studies, can certainly do no harm in this field.

If one looks at the examples, they have two features in common. One is that the social sciences which one is talking about are all, if not "hard" disciplines, then at least such as to bow themselves easily to application. They are hard in the sense that they are geared to practical problems. The other common feature is that the social sciences in question have to do with research, albeit of the applied variety. The point is to bring to bear a social science perspective on real issues, and to use social science methods for making relevant information available.

It would be easy—too easy perhaps—to go on from here to the consignment of existing training practices for students from developing countries. It appears sometimes that an unusual proportion of these students opt for highly theoretical subjects. At the London School of Economics it is quite a few years since the Fair Medal for the best student in statistics was not given to one from a developing country. Econometrics is popular with these students. (Some, or so I am told, find mathematics an easier medium of communication than English when they come.)

In the developing countries themselves, on the other hand, it appears that many young social science students prefer the "soft" subjects of incommensurable social analysis, or ideologically suspect "theoretical" approaches. Not surprisingly perhaps, many of them find it difficult to get a job.

I said it would be easy to castigate such practices, and I meant it. There is nothing wrong at all with the Fair Medal going to students from Asia or Africa for ever, if they are the best, or with some of the leading theoretical economists coming from developing countries, or indeed with the important contributions of social science generalists from India and Brazil and elsewhere. The question is not whether one should stop anybody from what they want to do. It is rather whether the universities of the world offer enough for those who would actually like to prepare themselves for problem-oriented applied research in the social sciences.

The fact that neither the LSE nor the Delhi School of Economics are very appropriate for this purpose, is perhaps not unduly worrying; it takes all sorts. But are there other places? There are undoubtedly some; but I suspect that on balance social scientists feel that the new practical applied work that has proved so important in some developing countries is not for them.

There is a kind of social science snobbery which, while ideologically rejecting any assumption of the inferiority of manual work, nevertheless leads people to avoid getting their fingers dirty by involvement in real problems. The applied and the hard is regarded as second-rate, or as technocratic, but in any case as undesirable. It is easy to see that practical social scientists cannot be educated in this way.

When I was in India and Indonesia this summer, I was impressed by the social scientists whom I met in the field: economists, sociologists, anthropologists, psychologists. But not one of them had received a training which made sense to them in their present jobs; they learnt what they needed on the job. Some of them were concerned with educating young Indians and Indonesians this summer. I was impressed by the social scientists whom I met in the field: economists, sociologists, anthropologists, psychologists. But not one of them had received a training which made sense to them in their present jobs; they learnt what they needed on the job. Some of them were concerned with educating young Indians and Indonesians this summer.

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NOTICE BOARD

Chairs

Dr Rebecca Pomeroy, reader in the department of languages at York University, has been promoted to the chair of Romance languages at the University of Oxford with effect from a date to be arranged.

Appointments

Universities
Belfast
Lecturers: P. L. Phillips (law); J. G. Docherty (electrical and electronic engineering); C. A. Geddes Boreham (plant education); I. A. Sneddon (psychology); J. S. Levi (economics); G. D. Johnston (therapeutics and pharmacology); A. C. Houghton Green (child health); C. H. Webb (microbiology).

Forthcoming events

A day school on the long-term offender is being held on November 19 at the Middlesex Hospital Medical School, 111, Portland Street, London, W.1. Fee: £14. Further information from the Deputy Director, Department of Extramural Studies, 26 Russell Square, London WC1B 5DP.

Open University programmes

November 12 to 18
Saturday November 12
10.30 Open Forum: Transferring to Further Education: All in a Day's Work. The first year of life: How in the future will we live? (10.30-11.30)
10.30 Open Forum: Transferring to Further Education: All in a Day's Work. The first year of life: How in the future will we live? (10.30-11.30)

Thursday November 17

10.30 Open Forum: OUSA Today—and Tomorrow. The first year of life: How in the future will we live? (10.30-11.30)

Friday November 18

10.30 Open Forum: OUSA Today—and Tomorrow. The first year of life: How in the future will we live? (10.30-11.30)

Correction

Mr R. Chesterton, senior lecturer in law at the University of Warwick will take up his appointment to the chair of law at the University of New South Wales in January 1978 and not 1978 as stated in our issue of September 22. Mr J. A. Jordan of Birmingham University has been awarded a £25,000 grant from the E. R. Squibb and Sons Inc for research on possible cervical and vaginal abnormalities after exposure to diethylstilbestrol in utero.

Noticeboard is compiled by Patricia Santinelli and Mila Goldie

COURSES

STUDY AT HOME
for a London University External DEGREE
Wolsey Hall, the only correspondence college with full courses for London University External Degrees provides individual instruction by highly qualified lecturers.

Dundee
Senior lecturer: Dr D. Parratt (bacteriology). Lecturers: Dr Ruth Barker (bacteriology); P. D. Cameron (jurisprudence); Dr I. Clark (psychiatry); A. Deacon (bacteriology); Louise A. Gay (physiology); Dr W. J. Harvey, Dr R. M. W. Horner (civil engineering); S. F. Hubbard (biological sciences); Dr David May (psychiatry); P. Rimmer (dental surgery); Dr J. A. Robertson (pathology); Dr Ruth Scott (anatomy). Research fellow: B. Hutchell (biochemistry); N. Christoff (mathematics); Dr W. S. Hislop (medicine); Dr K. F. McNeill (dermatology); C. Prout (biochemistry).

Edinburgh
Senior lecturers: D. C. Carter and T. V. Taylor (clinical surgery). Temporary senior lecturer: N. McDavid (medicine). Lecturers: W. S. Nimmo (anaesthetics); K. Ewing (constitutional and administrative law); R. I. Mueselsheldt (forestry and general practice); Janet MacInnes (history); C. H. Swanson (medicine); A. P. Brooks, Richard Logan (medicine); Evelyn Coultis (nursing studies); G. Houston (orthopaedic surgery); D. Chiswick (psychiatry); C. W. Gane (Scots law); R. L. Thoday (veterinary practice teaching unit); S. M. Crispin (veterinary surgery). Temporary lecturers: J. B. Sander (agriculture); T. A. Williams (business studies); P. A. Russell (Canadian studies); A. C. Owen (chemical engineering); R. G. Kelly and John Hannah (electrical engineering); Evelyn

Smith (English literature); R. P. Noble (forestry and natural resources); Ian Pearson (linguistics); Alan Fraser (medicine); Brian Prior (medicine); G. V. J. Jelliffe (pathology); P. D. Mawfield (sanskrit); D. Z. Shapiro (sociology); P. M. Little (supervisory practice teaching unit). Part-time lecturers: S. Hamilton, A. J. Hartley, N. Lofthouse, I. Morrison, B. J. Rankin (accounting and business methods); B. J. Brown, M. M. Faulds (nursing studies); Dr Margaret Whitmore (orthopaedic surgery); Dr M. J. Leckie and Dr D. G. McLellan (pathology). Part-time temporary lecturer: R. Adler (philosophy).

Hull
Lecturers: C. Brook (Institute of Education); M. A. Cotter (zoology); W. G. Cox (history); G. C. Elliott (educational studies); S. Ellis (sociology); P. J. Lambert (mathematical statistics); J. Lodge (physics); C. Mills (biology); H. Murray (politics); A. Parkin, N. M. Porey (politics); R. Ray (economics and commerce); M. S. Richards (geography); M. L. Smith (European studies); G. Squires (adult education). Temporary lecturers: P. F. Furlong (politics); D. B. Gupta (economics and commerce); P. Heymans (mathematical statistics).

London
The following had the title of professor conferred on them: Dr A. Bennett, professor of pharmacology, King's College Hospital Medical School; Dr D. A. Bowen, professor of forensic medicine, Charing Cross Hospital Medical School; E. Conway, professor of Latin, King's College; Dr M. J. Davies, professor of anatomy, St George's Hospital Medical School; Dr D. P. Hendry, professor of economics, London School of Economics; Dr D. W. Howe, professor of clinical zoology, Royal Veterinary College; Dr J. N. MacLennan, professor of economics (Birbeck College); Dr R. F. Wehrhelf, professor of Pure Mathematics, Queen Mary College.

Reader: Dr H. L. Shergold (mineral technology at Imperial College). Title of reader: Dr R. N. Bailey (French literature, Birkbeck College); Dr M. A. Branch (Finnish language and literature, School of Slavonic and East European Studies); Dr M. J. B. Duff (physics, University College); Dr G. Gabella (biology, University College); Dr L. R. Johnston (biochemistry, University College); G. P. Kirkbride (chemistry, Imperial College); W. Offer (biophysics, King's College); Dr J. L. Reid (clinical pharmacology, St George's Hospital Medical School); Dr N. R. Saunders (biology, University College); Dr P. Sherwood (food physics, Queen Elizabeth College).

General
Sydney Woodman has been appointed finance officer in the Inner London Education Authority in succession to Mr K. E. W. Lavelle.

Bristol
Mathematics—£50,410 from the hydraulics research station for the study of rain and associated processes in the surface zone of a beach.

Dundee
Medical biophysics, mechanical engineering and orthopaedic and traumatic surgery—Professor J. J. Martin to be director. Dr D. S. Bnar to be senior lecturer. £3,640 for work in the newly set up School of Biomechanics and Biophysics in Medicine on patient care in the field of rehabilitation engineering; £13,650 research work of Dr D. E. Watt and biological effects of neutron radiation.

Hull
Social administration—Dr A. McClaughlin £22,710 from SRC for his investigation on early child development and the home environment.

Recent publications
The Standing Conference on Educational Development in Polytechnics has published three new occasional papers: Student evaluation of teaching; Management and Business Studies; and Evaluation of Study Skills Courses. The book 'The Development of Study Skills in Higher Education', by Fraser Reid of Plymouth Polytechnic and J. A. G. (Ed.), £1.00; 'Making Academic Decisions in Committee' by Harriet Green, North London Polytechnic, £1.50. All available from Ferrus, Newcastle upon Tyne.

Grants

Universities

Birmingham
Physiology—Professor J. H. Walsten-croft; £23,114 from MRC for supra-splenic influences on the flexor withdrawal reflex. £15,193 from Education—C. V. Platts; £15,193 from SRC for an observational study of science teaching in school laboratories. Space research—Professor A. P. Willis; £19,381 from SRC for X-ray imaging for Space Lab 2.

Transportation and environmental planning—Dr G. M. Mackay; £62,555 from Department of Environment for investigation of injuries to riders of two-wheeled motor vehicles. Chemistry—Dr J. P. Symons; £22,700 from SRC for molecular dynamics of excited state reactions. Physical metallurgy—Professor R. E. Smallman and Dr M. H. Loretto; £12,700 from SRC for high voltage electron microscopy of materials. Chemical engineering—Dr D. R. Oliver and Professor J. T. Davies; £21,616 from SRC for turbulent drag reduction by surface microstructures. Mineral engineering—Dr L. A. Odor-jun; £27,750 from MRC for development of apparatus and technique for the characterization of flocculated sediments. Electronic and electrical engineering—Professor E. D. R. Sheehan; £20,172 from SRC for research in growth scatterer and wavefront curvature mapping.

Manchester
Pollution research unit—£16,000 from SRC for pollution research under the direction of Dr C. Milne.

Salford
Mathematics—£16,500 from the SRC for a project on statistical problems in the study of the human eye and Professor M. J. Griffin; £3,640 for work in the newly set up School of Biomechanics and Biophysics in Medicine on patient care in the field of rehabilitation engineering; £13,650 research work of Dr D. E. Watt and biological effects of neutron radiation.

Southampton
The Wolfson Electrostatics Advisory Unit—£40,000 to study lightning hazards in powder transport and storage systems. About half of the funds have been provided by the Health and Safety Executive, the rest by British European and American companies. Electrical engineering—£190,100 from SRC for investigation of some practical electrical machine problems under the direction of Professor Percy Hammond and Ken Blinn.

Warwick
Biological sciences—Dr M. H. B. Leacock; £50,800 from SRC for research on 'mobile robot processor'. Physics—Dr M. J. D. P. Woodhead; £21,250 from SRC for research in solid line computer for research in solid state physics. Biological sciences—Dr D. P. Woodhead; £22,568 from SRC for research on low damage low energy electron microscope fraction for measuring electron surface structure determination.

Polytechnics
Sheffield
Electrical and Electronic Engineering—£15,000 from MRC for development of a device to detect and measure the dark adaptation under the direction of Professor P. Fatt and Dr G. Falk.

of navigation, Southampton University, at the Royal Society of Arts, Adam Street, London WC2N 4BZ.

"Teaching and Learning in R. Studies", the twelfth annual conference of the Royal Society of Arts, is being held on November 17 at the University of Sheffield. The conference will be held at the University of Sheffield, Sheffield City Polytechnic, 100, Victoria Street, Sheffield S1 1AB. Do students learn? This is the theme of the conference, organized by Vida Carver, senior lecturer in education, Sheffield City Polytechnic.

"Student Housing", a conference held at the G.L.C. on November 21, will discuss educational authorities and the problems of the problems and are organized by the Educational Resources Centre, University of Walthamstow E17 4JB.

"16-19 Education", a one-day conference organized by the Educational Resources Centre, University of Walthamstow E17 4JB, will be held on November 28 at the 20 Bedford Way, London WC1R 4EU. Details from the Operational Studies Society, 111, Portland Street, Birmingham.

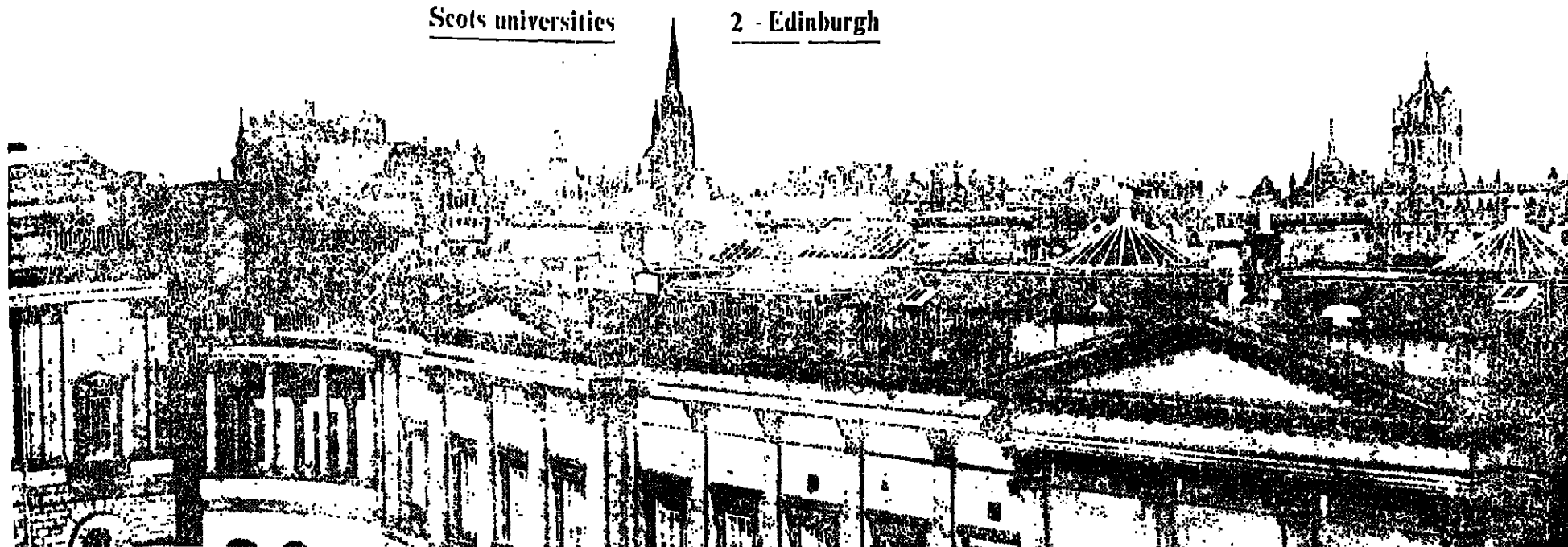
"Managing merchant ships—problems and solutions", a Thomas Gray Memorial lecture, will be delivered on November 23 by Captain G. W. Wakeford, formerly director of the school

of navigation, Southampton University, at the Royal Society of Arts, Adam Street, London WC2N 4BZ.

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Local wood obscured by international trees?

Edinburgh is a sleek city and its university is wise in the ways of the world. Large and successful as it is, the modern road that the other ancient foundations in Scotland, it banks in the University Grants Committee's approval, research council recognition and has a proud record in medicine, natural science, arts and letters.

It is not, however, complacent. Compared with the snugness of St Andrews or the workaday effectiveness of Glasgow, Edinburgh even seems to admit self-doubts. Perhaps the city which contains St Giles Cathedral and hosts the general assembly of the Church of Scotland fosters a puritan streak in university life.

The questioning associated with the two great debates of recent years—on university government (that is, student power) and on devolution—is stilled. The second debate was always conducted amicably and democratically. The first, however, was not. The questioning associated with the two great debates of recent years—on university government (that is, student power) and on devolution—is stilled.

One such name is Malcolm Muggidge. A Presbyterian minister with a good sense of the university's role, he is a general university view, for all that it is a great Christian foundation and still acts as a haven to the Church of Scotland through its divinity faculty, is even less charitable. Muggidge, as rector was "a disaster".

Edinburgh, it must be explained, had its student troubles later than in the south. It was not until after 1970 that a series of events—Muggidge's election and mishandling of the rector's role as chairman of the university court, the breakdown of the student union, the resignation of the rector—led to what Sir Hugh Robson, present principal, calls "a serious state of internal disunity".

After Muggidge broke the informal conventions guiding university government the student union, the resignation of the rector, the breakdown of the student union, the resignation of the rector—led to what Sir Hugh Robson, present principal, calls "a serious state of internal disunity".

Two examples will suffice. First, accommodation. Of every 10 students, three live in rented rooms, three at home with parents and family, and one in lodgings. Potentially there could be a serious accommodation shortage. Among the reasons it is avoided is the flexibility shown by the accommodation service.

David Walker continues this series with a look at Edinburgh University

but not on senate; a working party is reviewing the question. Behind the formal changes, too, Edinburgh has gone far in the modernization of such a large traditional organism. The pedagogical ideas, however, are not dead and many of them, Scots educated at Edinburgh, are tempted to pay at least lip service to ideas of participation and democratic decision-making within departments.

The university is recuperating in the sense that it is now absorbing some of the fruits of the spirited drive for growth under Sir Michael Swann. Sir Michael's name is held in great esteem in the physical sciences and biological departments. He was a great teacher, just as if Newcastle University were to ignore the history of Northumberland," Professor Mackintosh says.

The voices most strongly opposed to any version of the "localist" argument are those of the natural scientists. Edinburgh University is physically split: most of the science departments are on a separate campus three miles from the city centre. There, at King's Buildings, as the site is known, is concentrated the weight of the university's scientific departments. They depend on international connections and any mention of Edinburgh city district council, Lothian regional council or even Scottish government has either chortling or in deadly earnest about the demise of Edinburgh as a centre for scholarship.

However, many would not bless a stark local-international dichotomy. To Dr J. I. G. Cadogan, FRSE and Forbes professor of chemistry, "Edinburgh is a very effective institution, not really divided and we are fortunate to live in this city". He takes pride in the calibre of his students from the Scottish schools; he knows the Scottish system, having been at St Andrews. His postgraduates after seven years can hold their own anywhere in the world.

On the other hand, "most of us would pack up tomorrow if we came under local government. Our subjects only thrive in the big arena, under competition. A smaller pool would offer no competition. I mention it in my memoirs, the department's success in attracting research money, most recently from the Wolfson foundation, Edinburgh's teaching is predominantly Scottish undergraduate, by fostering postgraduate work graduates, by conducting excellent research. The local connexion is a red herring."

Opinion elsewhere in the science faculty, and indeed in medicine, is similar. In molecular biology where two out of 16 academic staff are Scots, or in geology where the regular professor is a proud Scot, opinions are broadly similar on devolution. That said, it would be wrong to confuse the question of political devolution with that of Edinburgh's "Scottishness".

A useful witness here is Professor George Donaldson, head of the department of Scottish history. He trenchantly rejects both the suggestion that Edinburgh does not do enough by way of Scottish cultural studies and the innuendo that the UGC has not supported Scottish historical work. "Scottish studies here have expanded enormously under the British flag; the university now does a very great deal." There are in addition courses devoted entirely to Scottish literature and the School of Scottish Studies works in the music, culture and local history of the North.

In recent years a posse of educational radicals, among whom Gordon Brown, Dr Nigel Grunt and Mr George Faulkes, convener of the Lothian Region education committee stand out, have pressed the university to be more community minded and more open of access. Inevitably their strictures have mingled with the nationalistic, monocentric complaint about the lack of Scottishness. Ammunition has been had in the shape of some very interesting and often high-quality academic reports from staff such as Dr Guy Neave and Mr Andrew McPherson detailing the social class composition of the student entry.

The strands are pulled together by Dr Grant who says: "Edinburgh University came to prominence in the nineteenth century because it met the needs of the time; it has got to do the same again." He means paying more attention to the Scottish dimension in cultural studies and education, and first and foremost joining in Scottish government.

Majority opinion in the university would probably back the judgment of the professor and head of the department of business studies, Dr Norman Hunt. Professor Hunt, a member of the UGC itself, calls Edinburgh "quite remarkable in its adaptability". He cites evidence from his own department, the first to be set up in Scotland and among the first departments of business studies in the United Kingdom to be linked with departments elsewhere—at Glasgow and Strathclyde in the Scottish Business School.

Better civic relations
The evidence for the university's adaptability is manifold. It is not just that a sixteenth century foundation has become a thriving twentieth century institution. It is that the university is by and large able to read the signs of the times. For all the vicissitudes of relations between it and the city—until the nineteenth century the town council said yes or no to professional appointments—they are now at a point where Sir Hugh Robson says he attends all the civic events he can.

During all the brouhaha over George Square and the architectural rapo of the South Side there was a smacking feeling of comradeship between the university and local authority. Both were large organizations bound hand and foot by decisions taken decades ago and utterly dependent on external sources of finance.

Edinburgh University's case when charged with forsaking the Scottish community in pursuit of national or international glories is threefold. First, of its 2,000 new undergraduates each year three-quarters are Scottish. This is felt to be the right balance. All the undergraduates are taught by the conveners of the Scottish degree system and its quality, together with the prize quality of the honours students, is held to depend on the calibre of staff. The measuring rod for academic quality is United Kingdom-wide, is international.

Second, it has shown its capacity to change. As Professor Shepperson in arts says Edinburgh now teaches more Scottish-centred courses than any other Scottish university. But third, and most important, Edinburgh University serves by doing what it has done for many years: it trains ministers for the Church of Scotland in the faculty of divinity; in the faculty of music students are prepared for teaching and performing; it trains doctors, dentists, vets, teachers and architects, in a profession that Scotland alone cannot employ. Community obligation does not stop there, but the values on which Edinburgh would have its research and scholarship judged are not Scottish. In this respect the university must be regarded as an international centre, only contingently related to the Scottish capital.



## Maggie Richards on Sheffield's approach Mapping out routes to adult education

A step has been taken towards reaching the vast number of "uncommitted" adults who are not participating in adult education in Sheffield, where a research team of six has compiled data on the city's present provision.

The first part of their work—a mapping exercise to discover those taking part in adult education and where they live—has now been published.

The report says adult education students in the city are generally home-owners, and employed, managers or professional workers. And the research revealed a strong link between participation in adult education and previous achievement in further or higher education.

It also confirmed the general supposition that there was a lower participation rate from working class areas.

The second part—a questionnaire sent out to 5 per cent of adult education students—is expected to be published in January. The two detailed reports will then provide a detailed picture of adult education.

The team's work has been sponsored by the Sheffield working

group on mature entry to education, which includes representatives from all the city's interested agencies.

Eventually, the working group intends to establish an adult education counselling and information service, and to produce preparatory courses to lure new adult students.

A conference organized last year by the working group led to the research project and the compilation of a compendium of adult education courses in Sheffield.

So far 150 copies of the compendium have been printed and are available according to the working group's chairman Dr Bill Bazant, Sheffield University's extramural department.

For the questionnaire and mapping project, the 5 per cent student sample was extracted by adults taking part in day and evening courses run by the local education authority and Sheffield University's extramural department. But the sample was confined to students on open access courses.

The team discovered that friends and neighbours appeared to have an important role to play in disseminating information, and in motivating and sustaining attendance at adult education classes.

Most of the students in the sample were found to be living within a mile and a half of their adult education centre, and there were links between attendance and car owners, and the provision of regular bus services.

School catchment areas proved a significant factor, according to the report. Participation rates also appeared to be affected by the location of adult education centres—at lower or middle schools—when parents were more familiar with the surroundings.

The team calculated participation rates per 1,000 population in each local government ward in Sheffield. This revealed a wide range of participation—a high of 108.9 in 1,000, and a low of only 9.7 in 1,000.

The report says: "The picture tends to confirm the general supposition that the more working class areas of Sheffield have lower participation rates."

An isolating map was constructed, smoothing out the data to remove small local variations, to produce an overall trend. This created "mountains" of high participation, and "valleys" of low density attendance.

It was also linked to the 1971 census for South Yorkshire. The report adds: "The high peak of adult education in the west of the city was found to correlate strongly with a high percentage of owner-occupied dwellings, while the lower plains to the north and west occurred in council-owned property, and usually the older council estates."

The percentage of persons classified as employers, managers and professional workers tends to be highest in the areas which have a high adult education involvement.

"The strongest correlation found was that of the distribution of persons in employment with an O-level, or Higher National Certificate, A level or degree. The highest incidence of adult education participants followed virtually exactly the highest incidence of those with previous attainment in further and higher education."

Conversely, those areas with low proportions of persons having such attainment have also low numbers of persons involved in adult education classes.

The report concludes: "The general picture is that the present participants tend to come from areas where houses are owner-occupied, where there are low numbers of persons to a room, and from areas where a greater proportion of the population are employers, managers or professional workers. Most of all, they tend to come from areas where a high percentage of the population has already some attainment in further or higher education."

**The Location and Characteristics of Adult Education Participants in Sheffield 1976-1977.** Adult Education Information and Survey Project. Dyson House, Sheffield Polytechnic, Pond Street, Sheffield.



Everybody knows the old story about the management school where lecturers seldom locate the right classrooms, the photocopier is perpetually out of action, the key to the audio-visual centre is invariably vanished and the student bars run at a whacking loss.

A visit to the Anglian Regional Management Centre quickly dispels the apocryphal stories of that kind. The centre's modern site at Danbury Park near Chelmsford is run with a spectacular efficiency and the student bar, needless to say, makes a handsome profit.

Just how much that reveals about the educational character of an institution is hard to say. But the ARMC, the first of the regional management centres set up by the government five years ago, is widely regarded as one of the few outstanding successes of a national management education strategy that has been stultified by its critics.

In those five years the ARMC's staff has shot from an initial 50 academic staff to nearer 80, and the range and reach of its courses have expanded at the same pace. It offers full and part-time courses in a broad spectrum of management specialisms, and its staff have undertaken numerous consultancy projects in Britain and overseas. Its physical resources, too, have grown impressively and the main site at Danbury is well equipped with residential accommodation, conference facilities, close-circuit television and computer terminals.

Ironically, what has held up the development of many of the other 11 RMCs have been largely managerial problems. Apart from a few lucky ones such as Sheffield, Portsmouth and Bristol, which were based on single polytechnics, most of them have had to negotiate a series of complex college mergers before starting work.

The Northern RMC, for example, is linked to both Teesside and Sunderland Polytechnics, and another had to be cobbled up by Slough College of Technology, High Wycombe College of Technology and Oxford Polytechnic. In many cases the marriage between institutions was tense and competitive, and institutional rivalries impeded the development of what were intended to be "centres of excellence" in management education.

The Anglian centre could have been beset by similar problems. It was born out of a potentially difficult merger between North East London Polytechnic and the management centre of the Mid Essex Technical College, but conducted the merger with a conspicuous absence of friction. Despite the structural changes and the rapid increases in staff numbers over the past five years the ARMC recorded hardly any resignations. The original staff from both institutions stayed on and now identify closely with the aims of the new centre.

The merger was helped by the fact that the centre's dean, Mr Bryan Littlewood, was an RMC enthusiast who had been a prime mover in setting up national management education policy. Originally based at the Mid Essex Technical College's management centre at Danbury Park, he saw enormous advantages in merging with North East London Polytechnic—a much larger institution geared up to further an higher education which commanded large resources and would open up large tracts of north London as a market for management services.

Mr Littlewood's team anticipated government policy and began laying down plans for the new centre a full year before the national RMC strategy was officially announced. The way ARMC rocketed ahead by attracting staff and resources owes as much to the dean's buccannery and managerial talents as to the goodwill of the institutions and authorities on either side.

He admits candidly that he wanted to lift the centre off the ground quickly to cash in on educational expansion before the recession arrived. "Those RMCs which dragged their feet for five years have had themselves trapped by the cut in resources now."

But there were difficulties, too. The college and the polytechnic had each developed a different ethos and aimed at different levels of the problems encountered by other RMCs. Management centres generally attract students who are older and more affluent than those in ordinary polytechnic departments, and they have to be luxuriously equipped to attract high calibre managers to their short courses. The ARMC staff are convinced that if they had to share premises with other polytechnic departments, relations would be considerably soured.

The ease with which the two



A business game in progress.

finally fused was due to a number of factors. One was the successful application of what Mr Littlewood describes as "a very deliberate, classic management exercise" designed to liberate the "synergic" energy of the two staffs and overcome split loyalties. The staffs were shuffled into small working groups and set to work planning a new role for the management centre.

But the delicate handling of human sensitivities was probably less significant than an unusual administrative structure which enabled the centre to "plug in" to the polytechnic without sacrificing the strong links it had already built up with Mid Essex Technical College, and colleges and employers throughout Essex and Anglia.

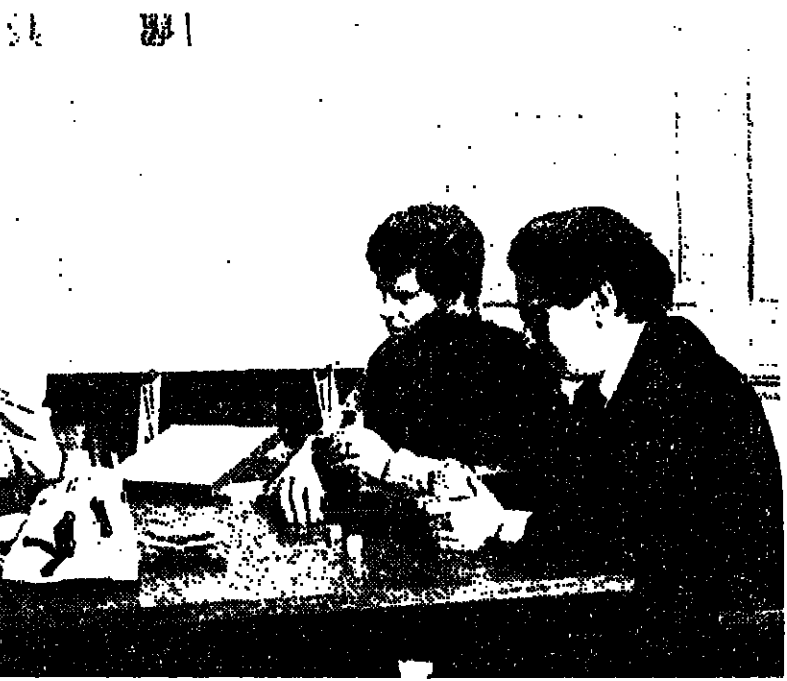
Although formally linked to the polytechnic's academic board, the management centre has an academic board of its own and a separate "policy committee" which—with representatives from local authorities, industry and surrounding colleges—acts as a separate governing body for the ARMC.

The arrangement gives the centre a degree of autonomy not matched elsewhere in the polytechnic. Combined with its physical isolation, this has helped to overcome many of the problems encountered by other RMCs. Management centres generally attract students who are older and more affluent than those in ordinary polytechnic departments, and they have to be luxuriously equipped to attract high calibre managers to their short courses. The ARMC staff are convinced that if they had to share premises with other polytechnic departments, relations would be considerably soured.

The simple diet of students at the

Peter David reports on progress at the Anglian RMC

## Management centre that knows how to manage itself



management centre is the diploma in management studies. Most take the courses in general management, described by one member of staff as "a conventional, taught sort of course". Students are typically managers in their late 20s and early 30s who attend on a part-time day or block-release basis. Many come from big local firms. Like the Chelmsford-based GEC Marconi,

But while general management development provides the bulk of the centre's work, it has also been highly successful in identifying and exploiting demand for management expertise in specialist areas. The department for management in the public services, for example, has built up an international reputation for its work in higher education management. It recently carried out consultancy projects on higher education in countries as far apart as Brazil and India, and participated in an important OECD project on the management of higher education in Europe. The department runs two major diplomas in local government and education management, and a special short course for university registrars.

The department of services to industry runs a similar mix of basic diploma courses and more exotic and specialized short courses. The diploma programmes focus on marketing and manufacturing, and there is a small postgraduate course in international marketing. The short courses are residential and intensive. On the four-week course run in collaboration with the National Computer Centre, for example, students are expected to "knuckle down from nine in the morning until ten at night."

Staff at the ARMC are apt to enthuse about the centre's own

was the set-piece lecture. His European upbringing—he was born, and later studied, in Hungary—was reflected in his liking of his for the role of the academic deity, remote in his audience, and holding forth to a large and reverential audience.

And he was very good at it. He had the presence and the eloquence for it. Students at his first-year sociology lectures always felt that they had not only had their minds enriched, but also that they had been present at an occasion, Theatre perhaps, but inspiring and highly-instructive theatre.

Perhaps there was also a personal element in all this. Professor Halmos was the quintessential individualist, who went his own way and saw no reason to believe that it was the wrong way.

Many who disagreed with him will remember him with admiration and affection.

Howard Jones

The author is professor of social administration at University College, Cardiff.

## OBITUARY

### Paul Halmos



By his time he came in. Cardiff as professor of sociology, sociologists had lost most of their non-Durkheimian fear of psychology, and some still raised their eyebrows at his hospitality to ideas from history, philosophy and social work. He mentioned clear evidence of a moral commitment in his work.

Paul Halmos, professor of sociology in the Open University who died recently, was what is sadly becoming a rare bird in university circles—the fully-rounded man. The situation confronting him was well-described by Philip Linn, who looked back nostalgically to the classical era when a man's knowledge was one, into his Eden the serpent in the shape of the professor was introduced, and needing something to profess he invented the "subject", breaking up "knowledge" in the process.

Certainly specialization has become the rule, and in the natural sciences, where there is so much to know, it is probably inevitable. Less justifiable is a kind of philtre, which sees the growth of the subject boundaries, as more important than the understanding of life or truth.

Professor Halmos treated such narrow scholasticism with disdain. Beginning his academic career as a psychologist at Keele, he hazarded professional status in his discipline by his interest in cultural aspects of society.

This unifying temper led him into his early work in stimulating co-operative thinking between teachers and social workers. Many on both sides of this professional divide will remember those stimulating

interdisciplinary conferences at Keele at the turn of the 1950s. Unfortunately, in the two decades which have followed, teachers and social workers have moved little closer together, whether in training, methods of work, or ideology. A fifth column of would-be professors seems to have penetrated into our classrooms and social work departments.

The Keele conferences, however, led directly to one of Professor Halmos's main achievements—the series of Sociological Review Monographs. He gave up their editorship in 1973 but, by then, he had produced no fewer than 20 volumes, mostly symposia.

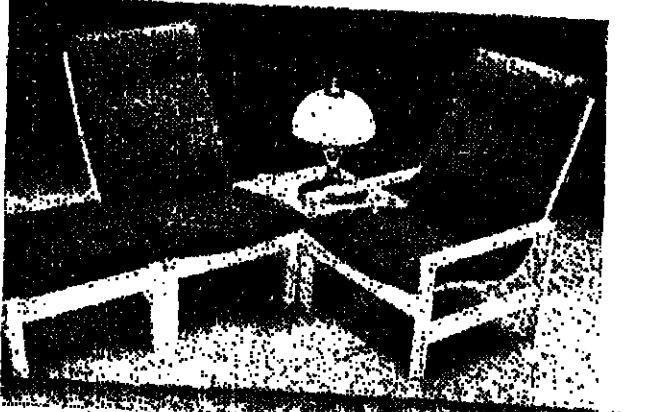
The first numbers consisted of the papers delivered at the interdisciplinary conferences, but he widened their scope to include volumes on social medicine, casework, penology, professionalization, mass communications, and even Japanese and Latin-American sociology. Sociological Review Monographs represent an impressive monument to his range of his interests.

His preferred teaching method

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# Hopes that learning programme will go on

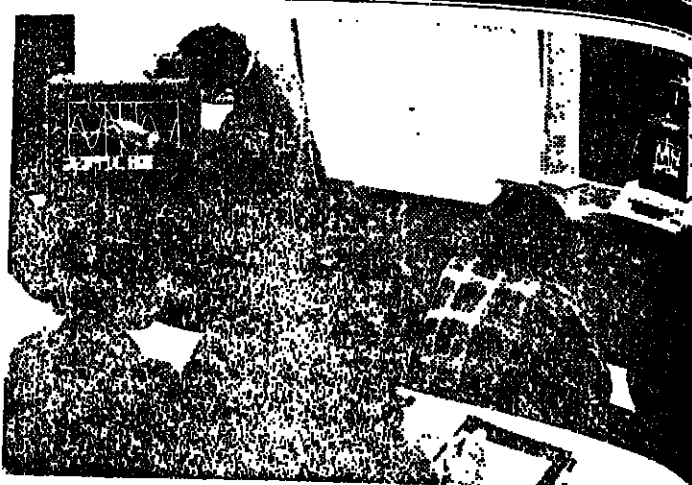
The National Development Programme in Computer Assisted Learning (NDPCAL) is in its final death throes. On December 31, 1977, after exactly five years of life, it wishes, having spent £2.6m.

What happens is appropriate? The sinking ship with rats leaving—or the fair and noble phoenix, mounting a funeral pyre of its own creation. While the ship metaphor has much to commend it not least for the limited supply of jokes made possible by your preference for the associated with the legendary phoenix. For NDPCAL recommended its own closure; more importantly, the essence of the programme will, we hope, live on, renewed and vigorous.

By the end of 1977, the major aim of the programme looks like being achieved—the "institutionalization" of computer-assisted and computer-managed learning in a range of education and training environments. With the ending of external funding (not money), three out of every four projects in institutions that have been directly associated with the programme seem to be set fair to continue, using hard money.

In the higher education sector, we estimate that out of 27 project institutions will survive the fire. Leeds, Glasgow and Surrey universities, for example, have established university-wide computer-assisted learning (CAL) services, which are internally funded. The New University of Ulster, Chelsea College and Queen Mary College have established services on a faculty-wide or college-wide basis as appropriate. The polytechnic sector is also well represented. Leicester and Plymouth polytechnics, for example, have participated in more than one project, thus ensuring a broad base of support from more than one teaching department.

But institutionalization is not without its problems. In the present economic situation, any innovation may find itself suddenly long on friends and short on cash. While, for example, at Leeds University, tenured appointments have been agreed for Roger Hartley's computer-based learning project, in



Dr. J. W. Humberton, of University College London, using a package.

some other institutions only short-term contracts have been forthcoming for 1978.

One of the major problems concerns the question of new development. In higher education, the development of teaching materials is a continuous process, as courses change and research advances knowledge. The development of a CAL package (computer program, plus associated teacher and student notes) can, in the National Programme's experience, take as long as 400 man-hours. Of this total, some 50 hours have been contributed by academic staff and the remaining 350 by staff specially funded by the programme. Since the level of CAL-specific staffing is expected to reduce with the end of NDPCAL, there could be severe difficulties with keeping new developments going. Without new development, CAL like any other innovation could slowly atrophy.

Following the end of the programme, the Government has agreed to fund certain activities, but not new developments.

Over a four-year period, starting in 1978, the DES is making available funds to the Council for Educational Technology (CET) to speed up the solution process. £60,000 (the National Programme's £786,000). By the end of the four-year period, the aftercare activities should have become self-sustaining.

In the past, the question of aftercare following large scale curriculum development and educational technology projects has often been forgotten. Perhaps computing technology demands that special attention be paid to aftercare, since computer software, unlike, say, commercially published print

# Techniques to bridge a management gap Plug in and tape the difference

The old saying "You can't see the wood for the trees", is particularly apt in describing many aspects of management education. The "trees" are the many techniques often taught in isolation, while the "wood" is the application of those techniques to real-life problems.

Any management course contains within its syllabus a number of different topics such as statistics, operational research and computers. Each of these topics supports the requirements of a present or future manager in providing tools for analysis of management problems. However, while there appears to be an interdisciplinary approach, the relationships between varying topics are often inadequately understood.

This article describes an attempt to bridge the gap between the topics of computers and quantitative techniques in a management course at Newcastle upon Tyne Polytechnic. Our aim, which we appear to have reached, was to have students use computers as a normal problem-solving tool when using quantitative techniques.

Quantitative techniques in statistics, operational research and in other subjects can be used to solve real-life problems. But solving such problems can be very time-consuming if tackled manually. To be able to use these techniques, students learn the theory and then prove it by solving simple examples. More complex examples are ruled out by time pressure if manual methods are used.

Because the student only uses manual methods for simple problems there is a danger that the connection may not be made between theory and real-life practice. Also, due to lack of time, skills cannot be developed through practice in the all-important areas of formulation, solution, and refinement of a quantitative model.

As a result of our modern environment, supported and reinforced by the media, there is both the expectation and demand that every management decision should be not only very extremely advantageous. Yet, in many management courses the subject of data processing tends to be treated in isolation. But in the real world, computers are completely linked with quantitative techniques: in fact some techniques such as mathematical programming cannot be used effectively without computers.

For this reason there is a need to bridge the gap between computers, quantitative techniques, and real-life problems in management education. If this could be done, it would provide better courses, improved student motivation, and staff development. But to satisfy these goals certain facilities were required, as well as a different approach to computer usage.

Because the costs of computer hardware have been decreasing in real terms for a number of years and the trend is continuing, it is possible to provide a computer terminal for each student quite cheaply. Also, many pre-written computer application programs are available—mostly written in the BASIC or FORTRAN programming languages—which cover most quantitative techniques. Here at Newcastle Polytechnic, we have developed a concept of the "naive" computer user, who would use a computer as if it were a superior pocket calculator.

The facilities provided for each student are first an interactive program terminal and second, a user-friendly application programs which prompt the student through a series of simple stages to enter the data, and present the results in a well-laid-out format. The student may also modify and resolve the problem, thereby recognizing the benefit of both accuracy and avoidance of drudgery and is motivated to use computers.

In addition, a suite of programmes has been developed which provide "instant" results that can be woven into real life applications. For example, one programme covers ordering policy for retail shop, warehouse, and factory together with economic ordering quantities for raw materials, simulated stock control and the distribution of least cost from factories to warehouses.

The student can now put into perspective management operations that were previously difficult to discern, and understand the cohesive processes of these operations by generating not just a numerical solution but policy which is justified by computer print-out.

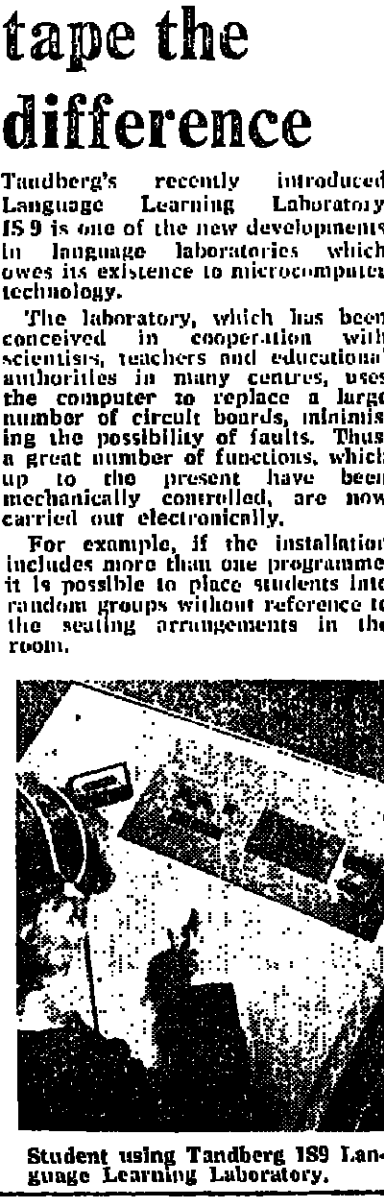
Currently the computer is being used in this way in final examinations. In addition, students are solving problems in minutes that could scarcely have been completed in the past because of the complexity of time and/or mathematical ability. In doing so the computer is enabling them to widen and deepen their understanding of the totality of management operations.

One development which could ensure that more time can be spent on problem solving would be a reduction in the period spent on the details of data processing on management courses.

With the advent of time-sharing services and main and micro-computers in the near future the computer will be regarded probably in much the same way as we today regard an electric motor: as just a component of other systems. A further step which is envisaged is combining classroom sessions with the portrayal of videotape of real life problems and the independent use of computer facilities. One film of a series has been made and the second is in production. The objectives are to provide solutions in terms of policies, courses of action, preferred routes, and alternatives justified by computer print-out—not just numerical answers.

Richard Hooper

The author is director of the National Development Programme in Computer Assisted Learning.



Student using Tandberg 189 Language Learning Laboratory.

# DIGITAL MAKES LABWORK EASIER by MAKING YOUR LAB/WORK HARDER

Great savings in research laboratory applications whether in industry, government or education have been made possible by the advent of microcomputers over past years. Now further development is enabling the microcomputer to replace several of the functions of other scientific instruments in the research laboratory. Digital Equipment Corporation with more than 80,000 computer systems in operation, representing a billion dollar business, is celebrating its twentieth anniversary.

The company's headquarters are in Massachusetts, USA, where it began operation as a small unit composed of three men, with a single product, logic modules. But its operations are worldwide and offices of computer one of which is the DECALAB family of hardware and software, specifically designed for laboratory applications by the Laboratory Data Products Group within Digital Equipment.

This provides a wide spectrum of capabilities for an equally wide diversification of laboratory environments, aimed at it is at chemists, physicists, psychologists, biologists and engineers. In

affordable and represent good quality which is our primary goal," he said.

Indeed these very features have been throughout the full range of the company and have led Digital Equipment Corporation to produce in 1982 the PDP-11 microcomputer. A 28-bit machine costing under 30,000 dollars, it put computational power in the hands of those who previously could not afford it.

Developed into the PDP-8, it became the workhorse of the scientific and engineering community who discovered that microcomputer systems could do specific jobs better and faster than larger systems. Out of this earlier development has emerged a range of computers, one of which is the DECALAB family of hardware and software, specifically designed for laboratory applications by the Laboratory Data Products Group within Digital Equipment.

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addition to varying power and performance levels, these systems also offer a price range that enables research. It also very convenient because there are many DEC computers in other places."

The DECALAB-11/03 is serving many purposes in the research area. It is, for example, used as a spectral analyzer and as a data control for gathering data from instruments. It also provides a display on the VDU. Another example of its capabilities is shown by coupling an analog-to-digital converter to the machine, which then produces a graph of the power spectrum of the turbulence.

"This is very difficult to do with any other instrument and much more complicated," Mr. Bernard said. "It can be done much more reliably when using the DECALAB-11/03. The computer is also used for taking pressure measurement readings and as a safety device for switching which it cuts out of range. You can, for example, program it to keep a check on overloading conditions."

The heart of the microcomputer is a four logic chips that incorporate all the electronics and circuitry of the major processor components as well as the usually standard instruction set with over 400 commands.

The DECALAB-11/03 was designed with the first time user in mind, but it is a completely expandable system with central processor, mass storage, a choice of lab interface, analog or hard copy, remote real time operating system and program languages BASIC and FORTRAN. They are well suited to single use or dedicated computer applications, collecting real time data from analog or digital laboratory instruments and performing calculations.

Digital Equipment's impact in the UK has largely been in educational institutions ranging from universities to polytechnics and colleges. Many of which have several complete Digital Equipment systems in the many interesting applications of the DECALAB-11/03 system can be found in the School of Engineering at The Halliwell Polytechnic where the microcomputer is being used in a research project funded by the Science Research Council funded project aimed at providing information and data to the building construction industry.

Speaking about their decision to purchase the DECALAB-11/03 system, R. E. H. Heady, senior lecturer in mechanical engineering, accompanied by the research project, said that after drawing up the requirements for the machine, he and his colleagues found it to be a very easy to transfer programs from the main computer on to R. Other systems, low cost.

"It also really stems from the fact that the major computer at the polytechnic is a DEC SYSTEM-10 and it is certainly convenient to have a small one of the same make," he said.

"But even so, we would have chosen the 11/03 for several reasons. It comes in a complete package, you can begin programming on the very day of delivery and within two weeks you can

achieve all the necessary programming. This saves time and money, both extremely valuable in research. It also very convenient because there are many DEC computers in other places."

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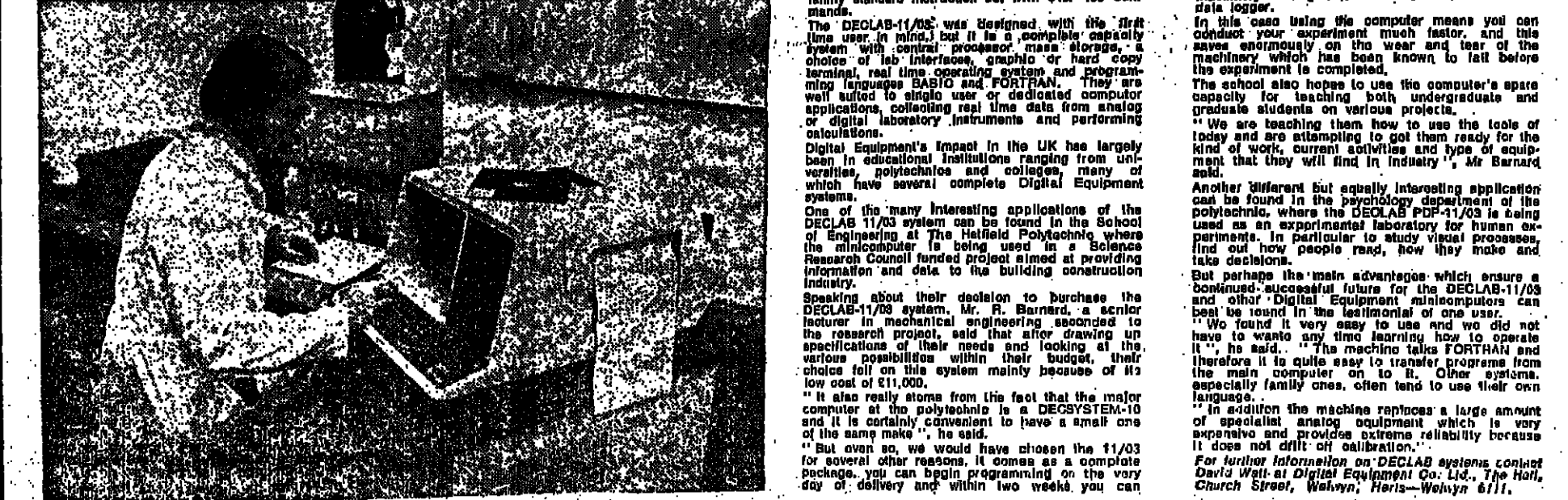
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TYPICAL DECALAB CONFIGURATION SHOWING GRAPHICS VDU.

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# Now mini bubbles, bits and beads

Computers have been so consistently oversold that to be euphoric about their future is to invite disbelief. Yet the fact is that education could advance as rapidly as applications in computers themselves.

There is an increasing tendency for commercial and scientific users to bound as they mostly are to large systems of terrifying complexity to lag behind in the application of new technologies. While many educationalists can contemplate with a terminal on every teacher's desk, many of the more established users of computers are openly wishing for a respite from ever more startling technology.

In this period of slow growth and economic stagnation, it is perhaps difficult to appreciate just how fast computers have developed. The 1960s was the decade of bigger and bigger machines. At the beginning of those 10 years one could, say, buy 1,000 numbers in a second. By the end of the decade a typical computer could deal with 100,000 numbers at a time adding them in 1/10th of a second.

That trend has continued to the present day but it is miniature machines that truly characterize recent developments. Today's £25,000 mini can outcompute yesterday's £1m giant.

The mini computer plugs into the ordinary electricity supply, needs minimal operating staff. All the available in compact form. Unwieldy magnetic tape has been replaced by convenient and reliable discs. The whole system is much cheaper, much smaller and altogether more human scale. Yet built-in intelligence (the operating software) is powerful and sophisticated.

Smaller still, for about £5,000, the executive, scientist or teacher can have on his desk a machine that can simulate an oil well, the national economy or whatever and display results in pictorial form in the twinkling of an eye. And today we stand at the beginning of the next great leap.

The microprocessor, a hole computer on a single tiny electronic chip, seems ready to replace every item of purpose-built electronic equipment from the inner workings of the nation's defence machine, say, bytes, bubbles and beads are all subsumed in a compact functional package.

The importance of the microprocessor lies not so much in its impact on conventional computing as in its role of adding an element of intelligence to equipment already regarded as computerized. It would be rather pleasant if your telephone answered automatically and established the caller had the right if your television could sense an accordingly!

Thanks to some visionary but solid work by the Department of Education and Science's National Development Programme in Computer Assisted Learning, education all this.

Computer and communications technology can make a wide range of educational material selectively and interactively available to teachers and students in schools and colleges throughout the country. The basic mechanism will be the television set enhanced by a microprocessor to give computational and communications capability.

These facilities exist today. Under the auspices of the National Programme some materials have been developed and are in regular use. Today such educational computing costs £10 per hour to run and perhaps £5,000 for the terminal and associated computing machinery. In addition, and in big addition, educational projects take many man-years to develop.

For the future, running costs do not look to be a serious obstacle. Already computer power is so cheap that communications costs—the cost of the telephone call to the computer—dominate. Once charges for this type of call are based on the amount of data transmitted rather than on the line holding time they will fall to one tenth or less of today's rates.

Equipment costs will also fall and terminals based around the use market for domestic television could well be significantly cheaper and even more importantly double up as conventional television receivers.

The big challenge is to control the cost of the teachers' contribution. Educational software is better property expensive despite being easier to use and easier to read—which is very important if programmes are to be published and shared languages. Whether through better technique or better systems, or just greater goodwill, material can be widely shared and programs can be developed over the future of the "micro" technology in education.

Ken Knight

The author is in the department of physics at the University of Surrey.











BOOKS

A tireless social reformer

William Beveridge: A Biography by José Harris



Lord Beveridge, Director of the London School of Economics and Political Science 1919-37; from a painting by Sir William Nicholson in the possession of the school.

In her final chapter, in which she draws together the threads of this substantial but engrossing study, Dr Harris places Beveridge as "the last of the great line of all-round social reformers who have played a significant part in moulding the institutions of Britain over the past two hundred years"

The report, "the most important blueprint for social reform ever produced in Britain", as Dr Harris justly calls it—and one might add the only one of its kind—has assured him such a place. It is strange to recall that it was almost by an accident of history that he was commissioned to write it, and that in one case had any notion of producing anything so ambitious, while Beveridge himself would have preferred to continue with work more obvious and relevant. Behind it, however, lay nearly 40 years of thought and experience, and before it, as it chanced, a fortunate moment for its appearance. Coincidence as it did with the turning of the tide of war, the report gave a lift to spirits low ebbed by misfortune and, to Churchill's dismay, was widely welcomed as a gleam of light at the end of the tunnel.

more writing and, finally, the chairmanship of two "new town" corporations and a committee on broadcasting. The record reads as that of a man almost averse to office; indeed Harris shows that despite the production of several important books and much research into trade cycles and unemployment, Beveridge did not really have a calling for a life of scholarship. It was involved in practical problems; hence his exultant exclamation on joining Churchill's staff in 1908: "Now I can write blue books". Yet this did not mean that he could not formulate great schemes and face the patient routine of carrying them out, unless, as Lord Selkirk suggested in an obituary, "he could lead without challenge or compromise".

Harris quotes the revealing comment of Harold Wilson, who looked back on his research at Oxford, that he was "probably the greatest administrative genius of this century" but "almost certainly the worst administrator". At bottom, in fact, he was more concerned with the inductive study of society than with the patient solving of special problems, though another element was his awkward temperament, with its vanity, its impatience, especially at the restraints of practical and political social relations, and at times, it was impatient at the official reception of the 1942 report that drove him into politics and brought the criticism that he seemed to expect the war to stop while his plans were carried out.

Harris's portrait includes the war, and she is particularly interesting on the mixture of success and failure that marked the years that followed. He carried through great schemes of expansion, which did much to give the school its world-wide reputation, and as vice-chancellor he was instrumental in the central site for the university the centring of its headquarters, launching the plans for the Senate House, which now, as Harris aptly puts it, hangs heavily over Bloomsbury. As time went on, however, his relations with staff became unhappy, as school secretary, by the presence of Mrs. Mair, his cousin's wife, who had long worked closely with him and was to become his wife on her husband's death in 1942. Another crucial topic to which due attention is given is the furrow over the Clyde in 1915-16, which long prejudiced trade union attitudes to Beveridge. He is exonerated from charges of repression, but his lack of political nous is again exposed. Each aspect of his career is dealt with at some length, but the most notable contribution lies in the discussion throughout of the basic tenets of his social philosophy. Dr Harris is critical of the "familiar image" of him as "a straightforward collectivist liberal whose famous reports sprung fully-armed out of his experiences forty years before" (though the source she quotes for this extravagant opinion will hardly bear this construction), and she shows, in particular, how between war and peace, in despair at wartime experience and the too ready acceptance of the "dole" in the postwar depression, he floundered in social policy and even for a time embracing orthodox economics. Yet his chairmanship from 1934 of the Unemployment Committee carried him back, by his own account, "to my first love in social problems", and prepared him for the opportunity that was to come in 1942, when, whether or not his full programme was entirely practicable, "in view of how little of it has ever been acted upon, it is not perhaps surprising that Beveridge's proposals for the abolition of poverty have met with only limited success".

The 1942 report now stands in time halfway between us and the first abandonment of his ideas, and problems he had hoped to solve are still with us. In a final comment Harris is fair in his assessment. Whether or not his full programme was entirely practicable, "in view of how little of it has ever been acted upon, it is not perhaps surprising that Beveridge's proposals for the abolition of poverty have met with only limited success".

Maurice Bruce

Folie à deux

Legends of the Thirties: Left and the Left in the 1930s by Ben Pimlott

The thirties, "the Red Decade", the Homeric age of the Left, the postwar years only Aldermaston reached equal rank in its mythology with such emotive images as the Hunger March, Spain, the War Front and the Left Book Club. Yet it was in fact a decade of Labour movement failure, of economic stagnation, of a resolute and profound difference between the Left and the Right, and of a demoralization, in which the Labour movement failed to make much headway despite the presence of 2,000,000 unemployed in prospect of war.

Mr Pimlott, a determined, parliamentary candidate and lecturer in politics at Keele University, puts most of the blame for these failures upon the Left rather than upon such culprits as the Parliament, the Labour Party and Labour's Executive. He declares that the engagements fought by the Left from 1911 to 1939 were essentially "symbolic" and that the Party's failure to win more than a few seats was due to its own "wrong" tactics. He argues that the Party's failure to win more seats was due to its own "wrong" tactics. He argues that the Party's failure to win more seats was due to its own "wrong" tactics.

Norman Mackenzie

BOOKS

Anti-social criticism

Seeing Through Everything: English Writers 1918-1940 by William H. Pritchard

Long, long ago, in the forties and fifties, American literary academics were enthralled by an ungainly beast called the New Criticism. This was a creed invented to combat the Menace of Marxism.

This seems a harmless if unsurprising discovery. What it soon turns out to mean, however, is that the author is determined never to explain the books by generalizations about the Age; "it is myself surprised how little good it does, when trying to pay attention to a poem by Auden or a novel by Waugh, to forcibly oneself with truths about the condition of England at that time, the 'social background' we sometimes pretend lies behind words of art".

Iain Wright

It is admirable. But a set of sharp optics does not make a critical eye, and Pritchard, in his anxiety to parade his "subjectivity", does not seem capable of fitting his components together, or even of ensuring that no vital ones are missing. "We will eschew comprehensiveness," he announces, in what I hope is meant to be a parody of academic pomposity, "selecting (sic) instead a few memorable moments", and that is precisely what he does. The omissions alone, from a study claiming to "come to terms with [the period's] most significant and enduring literary monuments", are startling. There is no discussion of Yeats, nor of Pound, nor of Joyce, and the author explains that this is because "these three writers were simply not in England during these years; the realm of myth and heroic literature was their true place of residence".

Here we have the lapsid Leavisite (as he confesses himself) diagnosing Scrutiny's gross failure of judgment in the face of modern English literature and setting out to remedy it, retaining Leavis's suspicion of craft and modern writer alike, his insistence on discrimination as the fundamental critical activity, but shedding the hysterical puritanism, and insisting that literature may be playful without being irresponsible. Pritchard takes "The Waste Land" down from its pedestal and per-

Ian Gregor

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Window on the house of fiction

The Novel Today edited by Malcolm Bradbury

of the concern. Those names indicate how widely the novelists themselves have participated in the critical debate both in this country and, as the essays by Roth, Barish and Bellow remind us, in America too. This is a feature which certainly helps to underpin the book's wide appeal, but it is not the participants so much as the argument itself which declares it. We can say that, from its origins, the novel has been a genre peculiarly anxious to undergo its own deconstruction, and ever watchful of trespassers from history and from fable. The anti-novel is as old as the novel. When we hear B. S. Johnson saying "Life does not tell stories", or talking about "the central image of the house of fiction" which provides a title for the essay in which Frank Kermode binds together his interests with Iris Murdoch, Graham Greene, Angus Wilson, C. P. Snow, Ivy Compton-Burnett, John Wain and Muriel Spark, we are struck by how different are those certain things you can say about people in their society which are slightly begging the terms, but not too much—objectively true", then we join a debate that goes back to Fielding, Richardson, Smollett and Sterne. Even in a momentary editorial claim that "taken together the essays display an important, fascinating critical debate" about the nature of contemporary fiction, the consequence, the book makes extremely useful reading for anyone trying to come to terms with the modern scene in the novel.

It is arrived, in truth, the novel has done its utmost ever since to make up for lost opportunities. James's observation, expressed in those characteristic phrases for Malcolm Bradbury's interesting collection of essays on the state of the modern novel, "Self-consciousness" is the abiding preoccupation of the volume, whether the roles are as different as those of Charles Snow, Muriel Spark, John Barth, Michel Butor or Ivy Compton-Burnett. And the critical question that remains with the reader is at what point does self-consciousness become the enemy of fiction?

On the way to that question a great number of useful things get said. No one can read this collection without feeling that Malcolm Bradbury has amply vindicated his editorial claim that "taken together the essays display an important, fascinating critical debate" about the nature of contemporary fiction. The consequence, the book makes extremely useful reading for anyone trying to come to terms with the modern scene in the novel. The essays demonstrate both the international character of the English, and also that there is in fact a much livelier sense of the changing modes of fiction than is usually allowed by official theories of the period. The contributions of Angus Wilson, Muriel Spark, Iris Murdoch, John Fowles, Philip Larkin and B. S. Johnson give a simple demonstration of the range

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BOOKS

Getting around

Mechanics and Energetics of Animal Locomotion edited by R. Mc. N. Alexander and G. Goldspink Chapman & Hall, £15.00 ISBN 0 12 13690 9

There has been a renaissance of the study of animal structure and function, much of it concerned with the way in which muscles work, produce power and compare to locomotion. Recent work has transformed an unexciting subject into a descriptive science soundly based on physical and mechanical principles. These advances have been variously reviewed but there is a need for them to be brought together. This book, which considers the physical and chemical basis of movement, aims to provide this general account of locomotion.

Animals are always in competition so it is vital that locomotion should be as effective as possible. Though the animals may be very different and use very diverse mechanisms, all use contractile systems to power skeletal structures. The book, logically therefore, starts with a consideration of the types of muscle, how these generate force, shorten and produce power and how the properties of the muscles are tailored to the needs of the animal. Particularly impressive is the clarity of the description of the sliding filament mechanism and how this is controlled by accessory proteins on the muscle filaments. However, not enough emphasis is given to the myogenic muscles of higher insects and how they generate power and there is a general over-emphasis on vertebrate muscle which is not entirely justifiable.

The chapters on the coordination of locomotion, though useful, are marred by problems of balance and scope, that on the invertebrates dismisses the considerable body of information on coordination in a page and a half and ignores some very elegant and highly relevant work on the way in which insect singing is controlled. The chapter on vertebrate coordination fails to draw the obvious parallels between the alteration of walking in decerebrate mammals and in headless insects.

The chapters on walking, swimming and flight are all interesting

but somewhat hard work. Throughout, there is the very laudable object of describing the processes from a sound mathematical basis and this is done in such a way that the conclusions appear periodically as a series of steps in the argument. Arthropod walking is treated very briefly—even though I was delighted to note that the ghost crab moves at 4 mph by trotting. The effect mechanism in the wing articulation of flies and the way in which wing beats are controlled are given too little attention.

Relatively easy, by contrast, is the chapter on burrowing. Here, the advantages of various arrangements of the body wall musculature and of the compartments of the body in worms and clams are described, the tank-like movement of snails is clearly explained.

The book ends with a chapter on locomotion by cellular organelles. There is a nice account that draws the mechanical parallels between the symmetrical beat of flagella with the hydrodynamics and to the sliding that occurs between the filaments that run along the organelle. The section on cytoplasmic movement draws together what is known of various types of amoebic movement in a lucid description, though this is limited to forms with non-rigid pseudopodia.

The book as a whole must be judged partly by its faults. There are errors and omissions in the reference lists, particularly of the earlier chapters, and there is a tendency for reference to be made only to reviews—though, of course, the reader can pursue the source through the review. Various other faults are less easily excused: there is a sad lack of cross-references between topics, chapters and authors; the subject matter is too rigidly confined to locomotion, with the result that important studies on related systems, illustrating important principles, are omitted; there is very little mention of the skeleton, which is surprising as it is against this that the muscles work.

Against these criticisms, I must come out overwhelmingly in favour of the book. It is timely, authoritative, remarkably comprehensive and readable.

H. C. Bennet-Clark

Defence against disease

Defence Mechanisms in Plants by Brian J. Deverall Cambridge University Press, £5.50 ISBN 0 521 21335 5

While we have become familiar with the difficulties of securing effective control of crop diseases there has been increasing pressure to reduce the use of fungicides. A better understanding of resistance mechanisms existing within plants has become highly desirable.

In recent years we have seen a rapid expansion of interest in biochemical and physiological studies of pathogens and diseases following the development of techniques in the related fields of microbiology and plant and animal physiology. Many of the techniques involved are extremely sophisticated and inevitably confined to the laboratory. It may perhaps be emphasized here that it should be clearly borne in mind that plant disease is the result of complex interactions between host, pathogen, microflora and the physical, chemical environment, and the study of any one of the factor in isolation is unlikely to contribute greatly to the solution of the main problems of securing effective disease control in crops.

Professor Deverall has now produced an excellent survey of the mechanisms involved in the defence of plant cells against attack by pathogens. This should be of great interest to all those engaged in research in plant pathology and to teachers of this discipline as well as to other

botanists. In his book attention is directed to defence mechanisms which operate before and after cells are penetrated by pathogens.

Two chapters are devoted to consideration of phytoalexins and their role in defence mechanisms. It is clearly established that most of the families Leguminosae and Solanaceae but limited studies with members of other families, as well as Deverall's own experiences with wheat and members of the Cucurbitaceae raise doubts about phytoalexin formation being a universal phenomenon in the plant kingdom. Deverall has therefore concluded that the existence of phytoalexins in some plant families does not prove their role in the defence mechanism of plants, and has emphasized that there is need for ingenious experimentation to test the hypothesis that phytoalexins stop the growth of parasites in resistant plants.

Such experiments will be difficult to make but they are very necessary for it must be realized that during the past few years concentrated on identifying the substances involved and on finding more and more examples, while little has been done in relation to establishing the role of the agents of resistance or to finding means by which they may be exploited in practical terms. It is particularly welcome that in this well written and well documented survey of the existing information Deverall has attempted to provide suggestions for solving some of the outstanding problems.

John Colhoun

Life support

Microbial Ecology by R. Campbell Blackwell Scientific, £4.25 ISBN 0 632 00389 8

A book on microbial ecology can be incorporated into university courses, but is reasonably priced and has some requirements.

The book's chapter would be instantly recognized as a wide range of university courses may not be titled "microbial ecology". Courses dealing with soil microbiology, palaeo-marine microbiology, environmental studies, biodegradation, water treatment, could all be illustrated by the book's illustrations of the complex actions making up the life

It seems to be a genuine attempt to bridge the interdisciplinary gap which has divided the two long. It shows the influence has come from lateral thinking: recent ecological research has an answer to microbiology graduates who regularly ask the relevance of their subjects to their main field. It incorporates an excellent of thermodynamics, chemistry, biology, parasitology, immunology, marine microbiology, building science.

The author emphasizes that biological ecologists are in the vanguard of a century ago, which about young microbiologists (and teachers) to advance their knowledge. After reading the book should feel that the subject is beginning to be seen in its due level of importance. In all, our very life-support depends on the kind of ecology described here. The book help but wish that the compulsory reading for engineering, economic and business studies—the many disciplines which had a great impact on our support system already.

Having emphasized the importance of methods of study biology the book gives an direct goes directly into certain concepts. However, through use of selected tables and from original publications (included) and further reading suggestions at the end of each chapter, the needs of advanced students while at the same time the ability of the book for undergraduates is preserved. On balance, most complete use of the book would be in advanced courses (including postgraduate) which integrate microbiology with the other sciences. It would particularly suit tutorial, seminar and discussion methods of teaching.

R. S. Holden

Insects, Hygiene and History

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BOOKS

Behind the scenes

The Pursuit of Nature: Informal Essays on the History of Physiology by Alan Hodgkin et al. Cambridge University Press, £7.50 ISBN 0 521 21595 6

The continued progression of scientific discovery is dependent on the dissemination of the results of research work; and discovery is built upon other discoveries that have gone before and theories are only erected upon the pyramid of hypotheses that have already been made public and have survived the tests of experimental verification. The time honoured ways of publishing scientific work depend for the most part upon the printed word in the form of scientific papers in the journals and in review articles written as monographs. It is rarely possible to give in a scientific paper, any account of the background in the research being reported and the average paper is a most inappropriate place for anecdotes. It is therefore an unusual privilege, to be taken behind the scenes as it were, by the six distinguished physiologists who contribute to The Pursuit of Nature. The book consists of essays on the historical development of six different fields of research and they were written as part of the celebrations of the centenary of the Physiological Society in 1976.

The first essay by A. L. Hodgkin is a marvellous account of the events which led to his experiments on nerve conduction. His experiments were not always done for logical reasons and by careful planning, as might be expected from the astute and highly condensed account to be found in the published papers. Much of it, according to Hodgkin, arose by accident or good fortune. The classical experiments on recording the electrical potential within the squid axon came about in 1939 at the Marine Biological Laboratory in Plymouth as a result of A. F. Huxley's attempts to measure the viscosity of axoplasm by seeing how fast a droplet of mercury would fall down the axil cylinder. Although this gave the unexpected answer that the droplet does not fall at all, Huxley suggested that it might be quite easy to stick a capillary down the axon and to record the surface membrane

potential changes. The second essay by A. F. Huxley is about the background to his work on muscle. His early interest in muscle physiology stemmed from a lifelong hobby, microscopy, and this led to his developing an interference microscope with which to observe living single muscle fibres. When these fibres contracted, he found that the changes in length take place chiefly in the I bands. Workers in the 1870s had established this but it was contradicted by others and finally forgotten. Huxley asks whether the case of a correct observation being made nearly a century ago and subsequently forgotten, is commonplace in scientific progress. He thinks that it is fairly common. He also believes that theories may be accepted with such enthusiasm that observations reported thereafter are perhaps wrongly influenced by them. This again may have disastrous effects on progress in a particular field of study and it may be that the danger of this kind of error is increased by the numerous symposia and conferences held now. At symposia the same viewpoint is put forward numerous times and is therefore believed to be true, even if the facts do not warrant such a conclusion.

Other articles are by W. Fuldberg on the work on chemical transmission of the impulse across the junction between nerve and muscle with which he was associated from the beginning. Again, there are many interesting anecdotes about the life and work of the scientists involved in making great advances. W. A. H. Rushton writes about the past 50 years of research on vision, R. A. Gregory contributes a review of the way in which harmonies were first discovered in the gastrointestinal system. Hormonal action, in the form of secretion which activates the pancreas, was discovered by Bayliss and Starling in one amazing experiment on the afternoon of January 16, 1902. The last essay is by R. A. McCance on perinatal physiology.

For anyone who wishes to go beyond the outline of discovery and to see a little behind the scenes, reading this beautifully written volume is an entertaining, informative, and highly agreeable way of doing so.

O. C. J. Lippold

Plant pathology

Plant Pathology and Plant Pathogens by C. H. Dickinson and J. A. Lucas Blackwell Scientific, £4.25 ISBN 0 632 00399 3

This book is beautifully written with a conciseness and clarity that would fall down the axil cylinder. The simple diagrams reveal rather than confuse and the electron microscope pictures are of a very high quality. I liked the layout of the book dealing as it does first with the characteristics of the diseased plant and the microbial pathogens before going on to look at the host-pathogen interaction at population, whole plant, cellular and molecular levels. However, if it is to form a true introduction to plant pathology then this book will need to be accompanied by a more traditional text which will deal in more detail with individual diseases, their causative organisms and control measures. Together they could form an exciting introduction to plant pathology.

The best section of the book is that dealing with host pathogen interaction at the molecular level. This is possibly one of the most difficult areas in which to work. In 1886 De Bary said: "We have little exact knowledge of the chemical-physiological processes in the life of the parasitic fungi because the symbiotic relation puts great complications and difficulties in the way of their precise investigation." Much of what De Bary said then still holds good today but it should be surprising and delighted at some of the very fundamental work that has been done, particularly in the last 10-15 years, and he would enjoy reading about the role of high molecular

weight compounds such as nucleic acids, proteins, enzymes and low molecular weight compounds such as toxins, phytoalexins and growth regulators in the host pathogen interaction. It is in these areas that so many exciting developments are taking place and it is also here that some of the discoveries will have wider implications than in plant pathology. Disease, whether of plants, animals or man has many mooring places at the molecular level. The incorporation of the pathogen's nucleic acid into the genome of the host is obviously one of these, with the concomitant switching on and off of genes which lies at the very heart of differentiation. The finding that repressor might be correlated with changes in the protein metabolism and enzyme activity of the host is a very active and rewarding area of research.

But the authors are being less than fair in saying that the relationship of the chemical industry with research pathologists is not entirely satisfactory as the availability of information concerning the activity, effects of their products is generally restricted. Certainly I have never found this to be so in this and related fields. On the other hand the authors have been more than kind to Rachel Carson when they state that "in her book Silent Spring [she] marshalled a convincing case against the use of this compound [DDT] on environmental grounds". Finally why do they state that "economic considerations are obviously of overriding importance [in plant pathology]" (page 5) and then make no further reference to them? But it is still a good book.

W. W. Fletcher

Abortion

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The first comprehensive account of abortion that deals with its history, sociological, clinical and demographic aspects and which faces the ethical issues involved.

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Also of interest

Journal of Anatomy

The Journal publishes original work and book reviews in the fields of anatomy, embryology and histology. In 1978 an extra volume will be published to reduce the delay between acceptance and publication of papers. Volumes 125-127 (1978)

Subscriptions: £80.00 per volume £90.00 per annum

Journal of Physiology

The Journal publishes reports on original research into all branches of physiology and the Proceedings of the Physiological Society. In 1978 the Journal will publish twelve volumes. Each volume will be issued fully bound in hard covers. Volumes 274-285 (1978)

Subscriptions: £160.00 per annum (U.K.) £190.00 per annum (elsewhere)

Transaction of the British Mycological Society

The Journal publishes papers and book reviews in the fields of mycology, both taxonomic and experimental, and plant pathology. From January 1978 the Bulletin of the British Mycological Society will be published by Cambridge University Press. The Bulletin appears twice a year and is included in the subscription to the Transactions. Volumes 70-71 (1978)

Subscriptions: £28.00 per volume £26.00 per annum

Journals may be ordered from a bookseller, subscription agent or direct from Cambridge University Press.



CAMBRIDGE UNIVERSITY PRESS



# Books from Longman

**Applied Plant Anatomy**  
D F Cutler

This book will enable the non-specialist to understand the basic structure of plants. The author illustrates how plant anatomy can be used to help in the identification of, for example, plant fragments in food, drug plants, timber, archaeological remains, and forensic material. An illustrated glossary of terms is provided, and there are lists of common plants showing particular anatomical features. Available early next year. Paper probably £5.00 net

**Practical Plant Physiology**  
J Roberts and D G Whitehouse

The wide range of experiments and tests in this book have been designed specifically for those operating on a limited budget. The experiments, which will be useful to schools and first-year university courses, cover the whole field of plant physiology. The authors have avoided duplicating earlier texts quoted well-known experiments, and have included suggested project work at the end of each chapter. Paper £4.95 net

**Systemic Fungicides**  
R W Marsh

Since 1972, when the first edition of this book was published, there has been a massive increase in the production and utilisation of systemic fungicides. These developments are reflected in this new and enlarged edition, which assembles the contributions of sixteen specialists from the UK, US and The Netherlands.

Notable additions include a summary list of the systemic fungicides now in commercial use. This gives chemical, common and trade names. Cased £12.00 net



# John Wiley & Sons Ltd

**GENE EXPRESSION Vol. 3: Plasmids and Phages**  
by S. Levin, Massachusetts Institute of Technology

This volume discusses the genetic systems of plasmids and bacteriophages, focusing on the means used to transfer genetic information and the strategies responsible for reproducing autonomous genetic elements.

0471 82176 4	622 pages	June 1977	\$24.00/\$40.00 (cloth)
0471 82177 7	688 pages	June 1974 (Vol. 1)	\$15.00/\$25.00 (cloth)
0471 82178 5	600 "	September 1974 (Vol. 2)	\$15.00/\$25.00 (cloth)
0471 82179 2	494 "	September 1974 (Vol. 2)	\$15.00/\$25.00 (cloth)
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**THE BIOLOGY OF SYMBIOTIC FUNGI**  
by R. Cooke, Botany Department, University of Sheffield

A large number of examples are used to illustrate the different types of symbiosis between fungi and higher organisms, both animal and plant. Antagonistic, mutualistic and neutral fungi are placed within an ecological framework and discussed in terms of their physiology and the effects on their respective hosts.

**ANATOMY OF SEED PLANTS 2nd Ed.**  
by Katherine Esau, University of California, Santa Barbara

An authoritative text on the structure and development of seed plants. Presents the latest concepts in plant anatomy through experimental, histochemical and ultrastructural approaches to the study of biological material.

**INTRODUCTION TO SOIL MICROBIOLOGY 2nd Ed.**  
by M. Alexander, Cornell University

This characterizes soil microflora from descriptive and functional viewpoints, considering the biological processes that take place in the soil and their importance to soil fertility, plant growth, and environmental quality.

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**The Times Higher Education Supplement**

## Biochemical

**Introduction to Modern Biochemistry (Fourth Edition)**  
by P. Kuriyan  
Academic Press, £11.30  
ISBN 0 12 399764 X

Biochemistry: the chemical reactions of living cells  
by David E. Metzler  
Academic Press, £17.75  
ISBN 0 12 492550 2

A few years ago, pure organic chemistry was still an adequate background for the study of biochemistry. Now things are different, and it is physical rather than organic chemistry that is needed. This change is clear from the two different approaches to undergraduate teaching used here.

Kuriyan's *Introduction to Modern Biochemistry* first came out more than 10 years ago. It starts as before, with a rigorous introduction to organic chemistry, but even this fourth edition (translated from the German ninth edition) has very little physical chemistry. The sections that really have been revised are very good, but unfortunately much material has simply been carried through from previous editions.

For students who literally do need an introduction to modern biochemistry the book is still a good buy. But the word modern is no longer justified. With such a fast-moving subject it is just not possible to update, from a purely organic chemistry standpoint, a book that has been around for more than 10 years. Truly modern biochemistry needs an entirely fresh approach.

This is provided by Metzler's excellent *Biochemistry, The Chemical Reactions of Living Cells*. This book has a strongly physicochemical approach, and the necessary background knowledge is included in the book itself. Properties of light, energy levels, and electronic spectra, for example, are all described in some depth in an unusual chapter, "Light in Biology".

Despite the physicochemical bias, the book is set firmly in the world of biology. Chapter one provides a quick survey of the plant and animal kingdoms, and there are later sections on immunology—a topic not often included even in a broad-ranging text of this kind. The book ends with discussions on ecology and genetic engineering.

Areas which biologists commonly find difficult (for example, enzymes, kinetics, thermodynamics) are dealt with fully, yet without intimidating sets of equations and derivations. Neglected areas like lipids and polysaccharides have excellent coverage, and for once the conformational angles of polysaccharides, proteins and nucleic acids can all be directly compared.

Raw experimental data is almost entirely lacking, which is perhaps unfortunate in a text at this level. There is, however, some good methods sections, and nearly every research technique currently in use has at least an explanatory sentence.

In over 1,100 pages this highly readable book covers all the biochemical topics commonly taught in honours undergraduate course.

**Reviewers**  
Maurice Bruce is author of *The Shaping of the Modern World and The Rise of the Welfare State*; John Colthoun is Reader professor of cryptogamic botany at the University of Manchester; Claire Cross, author of *Church and People 1450-1660*, is senior lecturer in history at the University of York; W. W. Fletcher is professor of biology at the University of Strathclyde; P. J. Hogarth is lecturer in biology at the University of York; G. J. Lippold is reader in physiology at University College London and author of *Origin of the Alpha Rhythm*; S. C. Rankin is lecturer in economics at the University of East Anglia; Ian Wright lectures in English at the University of Cambridge and is a fellow of Queens' College.

# BOOKS

## Complex fusion

**Immunobiology of Gametes**  
edited by M. Edidin and M. L. Johnson  
Cambridge University Press, £14.50  
ISBN 521 21441 6

Fertilization is arguably the most crucial single step in the entire reproductive process. The event is preceded by extensive preparations of both egg and spermatozoon in the gonads and genital tracts and although there are marked elements of chance in their arrival at the site of association, the final and successful union of these genetically dissimilar cells requires interaction of considerable complexity.

This book is largely a detailed and critical assessment of the state of knowledge on the membrane properties of the mammalian gametes and their role in immunology and genetics. Functional aspects are emphasized throughout and the relevance of the accumulating information to normal gamete and zygote physiology, as well as to timed pathological circumstances and the possibility of devising inhibition of fertilization for full consideration. Although it is clear that the male gamete is still receiving a disproportionate amount of various kinds of attention, the marshalling of a variety of pertinent data on the plasma and outer membranes of the egg.

The scope of the book goes beyond that indicated by its title. The organization of the membrane and the distribution and mobility of various cell surface determinants on both eggs and spermatozoa, and the changes effected by fertilization,

are discussed in the light of evidence from an impressive range of techniques such as electron microscopy, freeze fracturing, labelling, antibody tagging, and laser-beam immunology. The function of major sperm enzymes, auto-immunity, zona specificity of sperm actions and biochemical changes in oocyte maturation and early embryonic development are all dealt with in equal fashion. These are topics, yet they are treated with a plausible thread of continuity by virtue of their common concern with the mechanism and control of gamete formation and fusion.

To a great extent, the book is not, it is not, another publication devoted to the cataloguing of sperm responses to sperm antigens and other immunological and often very characterized clinical presentations as well as to a freshness and vigour which is quite apart from the usual. It thus maintains the high level of the previous series on Clinical and Immunoreproduction, based upon meetings of scientists of scientific interest in both clinical and basic research workers alike, engineering a new awareness of current trends in this field.

W. D. B...

## Adaptable crabs

**The Biology of Crabs**  
by G. P. Warner  
Elek, £6.95  
ISBN 0 236 40087 8

There can be few of us whose seaside experiences do not include an encounter with crabs, either as fishermen, beachcombers or in a salad. No doubt many are content to leave it at that, which is a pity, for the crabs are a fascinating group of animals which have taken full advantage of the opportunities open to them in colonizing the sea and its margins.

Crabs are decapods, and represent about one fifth of all crustacean species. They range in size from the giant Japanese spider crab with a claw spread of some 3.5 metres, to the small pea crabs of less than 1 cm which inhabit muscovy shells. They vary from the heavily armoured slow moving stone crabs to the more lightly built "ghost" crabs which can run forwards, backwards or sideways with equal facility at speeds approaching 2 metres a second. Swimming crabs have their hind legs flattened as paddles to propel them rapidly through the water. The group have representatives adapted to living in most marine environments, and many that have penetrated fresh water or become semi-terrestrial, even climbing trees

**New from the Pitman Advanced Publishing Programme**  
**The Origin & Early Evolution of Animals**  
by Earl D Hanson

This major work presents a fresh approach to phylogeny, the major unfinished task in biological studies. Part I develops a consistent and rigorous set of phylogenetic principles; Part II applies them to the evolution of the unicellular and the more primitive multicellular animals; and Part III offers a critical overview of the theory and the phylogenetic conclusions which it generates.

Earl D Hanson is Fisk Professor of Natural Science and Professor of Biology at Wesleyan University, Middletown, Connecticut.

Cased/680pp/130 line and half-tone illustrations  
ISBN 0 273 01132 4/£23.00  
Published October 1977

FURTHER DETAILS are available from Enquiries Executive, Pitman Publishing Ltd, 39 Parker Street, London WC2B 5PA.

# Classified Advertisements Index

- Appointments vacant
- Universities
- Fellowships & Studentships
- Polytechnics
- Technical Colleges
- Colleges and Institutes of Technology
- Colleges of Education
- Colleges of Further Education

- Colleges and Institutes of Higher Education
- Colleges and Departments of Art
- Research Posts
- Administration Overseas
- Adult Education
- Librarians
- General Vacancies

- Official Appointments
- Appointments wanted
- Other classifications
- Awards
- Announcements
- Exhibitions
- Personal Courses
- Holidays and Accommodation

**UNIVERSITY OF NATAL**  
**DEPARTMENT OF MECHANICAL ENGINEERING DURBAN**

Applications are invited from suitably qualified persons for appointment to the post of

**Senior Lecturer, Mechanical Engineering (Control)**

to assume duty in January, 1978, or soon thereafter. The salary scale attached to the post is: R8 820 x 360 to R9 900 x 450 to R11 250 per annum plus 10 per cent gratuity.

The commencing salary notch will be dependent on the qualifications and experience of the successful applicant. In addition, an annual vacation savings bonus is payable, subject to Treasury regulations.

Applicants should state whether they have an obligation in respect of Public Service Commission Bursaries. Lecturing Staff in the Faculty of Engineering can obtain permission to do private specialised consulting work on a limited scale.

Application forms, further particulars of the post and information on pension, medical aid, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, King George V Avenue, Durban, 4001, with whom applications, on the prescribed form, must be lodged not later than 30th November, 1977, quoting Ref. Adv. D 45/77.

**UNIVERSITY OF EAST ANGLIA NORWICH**

**SENIOR RESEARCH ASSOCIATE (Hydrological/Climatological/Geological/Earth Sciences)**

The Climatic Research Unit requires a person with a background in one or more of these fields to investigate possible changes in groundwater recharge to the English Basin shale aquifer and other related matters over the past 50 years. The proposed work requires a person with interests though not necessarily formal training in hydrology and palaeoclimatology. Candidates should have a proven ability to work independently and are expected to have at least a Ph.D. or equivalent experience. The post is for a definite period of two years, according to age and qualifications, which will be on the scale £3,333-6,667.

**SENIOR RESEARCH ASSOCIATE (Meteorological/Applied Mathematics)**

The Climatic Research Unit requires a person with experience in one or both of these fields to work as part of a team investigating changes in high-latitude atmospheric circulation patterns and their relationship with Arctic sea ice distribution. A Ph.D. or equivalent research experience is required and some experience in atmospheric and/or oceanic numerical modelling is essential. Salary according to age and qualifications will be on the scale £3,333-6,667.

**RESEARCH ASSOCIATE (Meteorological/Climatological)**

The Climatic Research Unit requires a person with experience in synoptic meteorology/climatology to continue an ongoing investigation into the details of great North Sea storms of the past. The work entails data collection from historical documentary sources and the meteorological analysis of these data. A degree with formal training in meteorology/climatology, or equivalent post-graduate experience is essential. Salary will be at a point on the scale £2,944-4,100.

Applications (one copy only) giving full particulars of age, qualifications and experience, together with the names and addresses of two persons to whom reference may be made, should be lodged with the Administrative Assistant, Climatic Research Unit, School of Environmental Science, University of East Anglia, University Road, Norwich NR4 7TJ, from whom further particulars may be obtained. In making the reference you are particularly requested to give only the names of those who can immediately be approached by the University. No forms of application are issued.

**THE UNIVERSITY OF THE SOUTH PACIFIC**

Applications are invited for two posts available as soon as possible.

**LECTURER IN EDUCATION (POST 77/53)**

Candidates should be prepared to teach in the Faculty of Education and to undertake general supervision of the Faculty. They must have a strong interest in educational development and a proven ability to carry out such responsibilities. They should have a B.A. or equivalent with substantial experience in teaching and supervising in secondary schools/colleges. They should also have worked in development projects in developing countries. The appointment is for a period of three years with the possibility of extension. Salary and degree level and other conditions of service will be as determined by the University Council. Applications should be sent to the Registrar, University of the South Pacific, P.O. Box 1188, Suva, Fiji, to reach him no later than 25 November, 1977. Applications should also be sent to the University of the South Pacific Council, 50/91 Tottenham Court Road, London W1P 0DT. Further details may be obtained from either address.

**THE UNIVERSITY OF DUBLIN**

**TUTOR IN THE SYSTEMS DEVELOPMENT PROGRAMME**

Applications are invited for a one-year contract appointment as Tutor in the Systems Development Programme. This programme is supported by the Irish Government and offers a M.Sc. degree course for Study Fellows from developing countries. The programme is interdisciplinary in character and emphasizes the systems approach to planning. The curriculum includes development administration and applied systems analysis. An individual course of study and skill development for each Study Fellow is focused on a selected development problem from his own country.

Suitable backgrounds are development economics, regional planning or project management and work in a developing country and university teaching experience. The appointment is for a period of one year with the possibility of extension. The salary range is £6,663-£8,459 and the post is tenable from January 1st, 1978. Further information may be obtained from the Establishment Officer, West Theatre, Trinity College, Dublin 2, Ireland, to whom applications should be sent by November 28th, 1977.

**UNIVERSITY OF SHEFFIELD Union of Students RESEARCH OFFICER**

Applications are invited for the post of Research Officer for a period of two years from 1st January, 1978. The Research Officer is responsible for the collection and dissemination of information to the Union in furthering the interests of its members; duties include the undertaking of research projects in the fields of education and student welfare and the maintenance of a library.

Salary will be within the scale of £3,333 to £5,627 (subject to review).

Applications, stating age, qualifications and experience and giving the names of three referees, should be submitted to the Manager, Union of Students, University of Sheffield, Western Bank, Sheffield S10 2TG, from whom further information is available. Closing date for applications: 25th November, 1977.

**UNIVERSITY OF SINGAPORE PHARMACOLOGY**

Applications are invited for teaching appointments in the Department of Pharmacology. Candidates must have first degree in medicine or science and appropriate post-graduate qualifications. They must have a strong interest in teaching pharmacology in relation to the needs of students taking professional courses in Medicine, Dentistry and Pharmacy and preference will be given to candidates with relevant practical experience in the case of recent medical graduates. Opportunities exist for them to maintain and develop their clinical experience and, for suitable candidates, to obtain further training in Clinical Pharmacology. Gross monthly emoluments in the range from \$31,420 to \$36,045 approximately, the initial amount depending on the candidate's qualifications and experience, and the level of appointment, offered. The gross emoluments comprise basic salary and the National Wages Council wage allowances. In addition, the University pays a 13th month annual allowance of one month's salary in December of each year. Leave, medical, housing and provident fund benefits are available.

Candidates should write to: The Registrar, University of Singapore, Singapore 10, giving curriculum vitae (bi-data) with full personal particulars and also the names and addresses of three referees.

**LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY**

**EDUCATIONAL SOCIOLOGY**

Applications are invited from graduates for a fixed term appointment as LECTURER IN EDUCATION, with special reference to the sociology of education. The appointment, to be made as soon as possible, will terminate on 31st July, 1981.

Salary within scale £6,333-8,666 (under review). It is hoped to appoint within the lower half of the scale. Postcard requests for further particulars and application forms to: West Theatre, Trinity College, Dublin 2, Ireland, to whom applications should be sent by November 28th, 1977.

**Belfast The Queen's University Chair in the Faculty of Law**

Applications are invited for a Chair in the Faculty of Law from January 1, 1978, or such date as may be arranged. Although the vacant Chair is designated "Chair in Law", applications from suitably qualified persons with interests in other areas of the Law will be given equal consideration. The salary is £8,750 per annum (under review) with contributory pension rights under the FSSU/USB.

Further particulars may be obtained from the Registrar, University of Belfast, 977 1st Avenue, Belfast, BT7 1NN, Northern Ireland. Closing date: December 15, 1977. Please quote Ref. 77/THE5.

**THE UNIVERSITY OF PAPUA NEW GUINEA**

Applications are invited for the post of ASSISTANT LIBRARIAN (Cataloguing) Grade 1 or 2, initially in Port Moresby and Goroka TEACHERS' COLLEGE.

Applicants must hold the Registration Certificate of the Library Association of Australia or a similar internationally recognised library qualification. To qualify for Grade 2, applicants must in addition hold a first degree. Previous cataloguing experience is essential.

For further details write to the Librarian at the University.

Salary: Assistant Librarian Grade 1: K1,113-K6,127 p.a. Assistant Librarian Grade 2: K658-K8,883 p.a. (K1 sterling=K1.37). In addition, an allowance of K1,300 per annum if single is payable. An extra K1,000 Marriage Allowance may also be payable.

Applications should include a detailed curriculum vitae, a recent small photograph and the names and addresses of three referees.

Conditions include provision of study leave and FSSU superannuation.

Conditions of appointment are available from the Secretary, Box 4122, Port Moresby, to whom applications close on 2 December, 1977. Applicants resident in UK should send a copy of application to Inter-University Council, 90/91 Tottenham Court Road, London, W1P 0DT.

**JAMES COOK UNIVERSITY OF NORTH QUEENSLAND GRADUATE DIPLOMA OF MATERIAL CULTURE**

Applications are invited for enrolment for the Graduate Diploma of Material Culture. The Graduate Diploma is a one year programme that combines both theoretical and practical work and is designed to provide a sound academic preparation for students planning curatorial careers in cultural museums. It will be of particular interest to young curators already in museum posts. Special arrangements may be made for the diploma requirements to be completed in part at their own museums.

The Graduate Diploma will also provide a sound preparation for material culture research work and will assist to encourage fresh approaches in this field. It will therefore be of interest to those intending to work for research in the field of material culture.

Entry requirements: B.A. or B.A.(Hons), or equivalent qualifications and three years' university study.

Applications are invited both from within Australia and overseas. Those interested should write strictly limited in size early in the year.

For further information on the Graduate Diploma in Material Culture, write to the Registrar, James Cook University, G 4811, Australia.

**UNIVERSITY OF WESTERN AUSTRALIA Perth ITALIAN LECTURER**

Applications are invited for appointment as Lecturer in the Department of Italian from 1 January, 1978, or as soon as possible thereafter. No specific field of specialization has been assigned to this position. The current salary range for a Lecturer is \$41,632 to \$48,822 p.a. Benefits include superannuation, sick leave, long service leave and housing allowance. Further information may be obtained from the Staffing Officer.

Applications in duplicate stating full personal particulars, qualifications and experience should reach the Staffing Officer, University of Western Australia, Nedlands, Western Australia 6009, as soon as possible, enclosing a resume and the names and addresses of three referees. Preliminary interviews will be held in Perth in December.

**DALHOUSIE UNIVERSITY HALIFAX, NOVA SCOTIA, CANADA SCHOOL OF BUSINESS**

Applications are invited for several faculty positions in the Management Science Area of an expanding Business School. Duties include teaching graduate and undergraduate students in Computer Systems, O.I.T., Production and Statistics. Next American rank and salary levels plus relocation allowances. Qualifications are a Ph.D. (or near completion) in cognate area plus a significant research record for a more senior appointment. Interested persons should write for further details to Professor M. C. Martin, as soon as possible, enclosing a resume and the names and addresses of three referees. Preliminary interviews will be held in Halifax in December.







Polytechnics continued

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To be subject leader for Politics, and in particular to lead the Politics contribution to a CMAA social science degree.

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PLYMOUTH POLYTECHNIC
School of Behavioural & Social Science
LECTURER II SOCIOLOGY
Salary: £3,279-28,483 (+ supplement range £468-242 p.a.)

oxford polytechnic

Applications are invited for the post of REGISTRAR (£7,927-£8,527)
who, as the chief administrative officer, is responsible to the Director for the administration of the Polytechnic, and is Clerk to the Governors.

NEWCASTLE UPON TYNE POLYTECHNIC
Department of Mechanical Engineering
LECTURER II IN PRODUCTION ENGINEERING
Applicants should possess a graduate qualification in Production of Mechanical Engineering and have relevant research or industrial experience.

SHEFFIELD CITY THE POLYTECHNIC
PRINCIPAL LECTURER IN LAW AND ADMINISTRATION
PRINCIPAL LECTURER IN HUMAN AND REGIONAL PLANNING
LECTURER II SENIOR LECTURER IN LAND MANAGEMENT

MANCHESTER THE POLYTECHNIC
FACULTY OF MANAGEMENT AND BUSINESS
DEPARTMENT OF ACCOUNTING AND FINANCE
LECTURER II IN ACCOUNTING
Required on degree foundation in one or more of the following areas: ACCOUNTING, FINANCE, MANAGEMENT, BUSINESS ADMINISTRATION, FINANCIAL ACCOUNTING AND FINANCE.

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LECTURER II IN ACCOUNTING AND FINANCE
Temporary post for two years beginning 1 January, 1978.

WALES THE POLYTECHNIC POLYTECHNIC CYMRU
Applications are invited for the post of DEPUTY SENIOR LECTURER II IN SOCIOLOGY
This is a temporary appointment for two years (with the possibility of extension) from 31st January, 1978.

Colleges of Education

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LECTURER II IN LAW
Applications are invited from qualified graduates in law, professional or research degrees, or teaching in law, mainly on multi-disciplinary courses.

LONDON INNER LONDON EDUCATION AUTHORITY
PHILIPPA LAWRENCE and FURZDANOVIC COLLEGE OF EDUCATION
London Court Road, London, SW16 3JH
Applications are invited for the temporary part-time post of ASSISTANT IN BUSINESS ECONOMICS to teach economics to school level. The appointment will be for two or three days a week (negotiable) and is renewable from 1 January, 1978.

Administration
NORTH LONDON ADMINISTRATIVE ASSISTANTS
Vacancies exist for two administrative assistants in the Registrar's Office. One mainly with a general interest and another with a specific interest in the Registrar's Office.

Colleges of Further Education

LONDON BOROUGH OF ENFIELD EDUCATION COMMITTEE
EDMONTON COLLEGE OF FURTHER EDUCATION
VICE-PRINCIPAL (Group 4—Salary £8,118 (Inclusive of allowances))
Required for 1 May, 1978.

TRAFFORD COLLEGE OF FURTHER EDUCATION
VICE-PRINCIPAL
Application forms and further particulars (enclosed) are obtainable from the Principal, Edmonton College of Further Education, Montagu Road, Edmonton N18 2LY and should be returned by 28th November, 1977.

COURSES
CAMBRIDGE BROOKSIDE COLLEGE
Will be holding a four-week course in the English Language, commencing in January, 1978. For successful candidates a place will be guaranteed on the Vice-Principal's course in Cambridge.

Announcements

Political Studies Association Social Science Research Council
POSTGRADUATE CONFERENCE IN POLITICS
The P.S.A. and S.S.R.C. are jointly sponsoring a conference at the London School of Economics, December 15-17, for first year research students.

Association of Scientific, Technical & Managerial Staffs
Day of Protest - November 16
ASTMS have organized a March to the House of Commons starting at 1 pm and ending with a lobby of all ASTMS MPs.

Research Posts
AUSTRALIA UNIVERSITY OF QUEENSLAND POSTGRADUATE RESEARCH SCHOLARSHIPS
Applications are invited for the post of Research Assistant in the Department of Biological Sciences.

Personal
COACHING
Newly qualified or experienced coaches are sought for a variety of sports.

POSTAL/ONS UNEMPLOYED
£20 to £150
MICROFILM INVESTMENT
£10-2000

DUNGLAN
Newly qualified or experienced teachers are sought for a variety of schools.

Colleges and Institutes of Higher Education

CHESHIRE COUNTY COUNCIL
MADGATE COLLEGE OF HIGHER EDUCATION
Principal, John H. Williams, M.A.
Resistant Appointment of a LECTURER II IN GEOGRAPHY (Part-time)

CANTERBURY CHRIST CHURCH COLLEGE
Applications are invited for the post of Lecturer in Dance, to be held from 1st January, 1978.

General Vacancies
Applications are invited for two posts of Assistant Registrar with responsibilities in the following areas: (i) Business and Social Studies (ii) Research Degrees (as well as some work in the area of Quinquennial Reviews)

COUNCIL FOR NATIONAL ACADEMIC AWARDS
Applications are invited for two posts of Assistant Registrar with responsibilities in the following areas: (i) Business and Social Studies (ii) Research Degrees (as well as some work in the area of Quinquennial Reviews)

Holidays and Accommodation
TUCSON, ARIZONA, U.S.A.
Noted course with excellent student house for accommodation in Tucson, Arizona, U.S.A. in January, 1978.

Department of Education and Science

PROJECT DIRECTOR
To undertake a study of the necessity, feasibility and cost of establishing a national information service on the transferability of educational credits for academic and vocational purposes.

HOSPITAL ENGINEERING CENTRE EASTWOOD PARK, FALFIELD, AVON
TWO LECTURERS
Candidates should be qualified to at least H.N.C. standard and have relevant mechanical, electrical or electronic engineering experience in either the Health Service or industry and/or teaching experience.

Research Posts
AUSTRALIA UNIVERSITY OF QUEENSLAND POSTGRADUATE RESEARCH SCHOLARSHIPS
Applications are invited for the post of Research Assistant in the Department of Biological Sciences.

Librarians

LEICESTER THE POLYTECHNIC
LIBRARY ASSISTANT (Library Services)
Applications invited from suitably qualified persons for the post of Library Assistant in the Department of Library Services.

Colleges and Institutes of Technology continued

ABERDEEN ROBERT GORDON'S INSTITUTE OF TECHNOLOGY
SCHOOL OF MECHANICAL AND OFF-SHORE ENGINEERING
LECTURERS
In Mechanical and Production Engineering and Mechanical and Offshore Engineering with honours degree and industrial or research experience.

General Vacancies continued
HOME-BASED TUTORS
Part-time tutors working at home are required to prepare correspondence courses in various subjects for the B.Sc. (Open) degree.

STRATHCLYDE REGIONAL COUNCIL

DEPARTMENT OF EDUCATION FURTHER EDUCATION
Applications are invited for the undated posts at Glasgow College of Technology Cowcaddens Road, Glasgow G4 0BA
LECTURER 'A' SOCIOLOGY
Applicants should have an interest in Introductory Sociology and/or Sociological Theory, and preference will be given to those with teaching experience in the appropriate areas.

RESEARCH ASSISTANT \* \* PUBLIC ADMINISTRATION
Applications are invited for the post of Research Assistant in the area of Public Administration, to assist in current research. The successful applicant will be expected to register for a higher degree of the CMAA and should be a graduate qualified in one or more of the following areas: Public Admin., Economics and/or Politics.

Paisley College

DEPUTY LIBRARIAN
Applicants for this newly created position should be graduates with qualifications in librarianship. Experience in academic library work, especially on the administrative side, would be valuable.

Colleges and Institutes of Technology

ABERDEEN ROBERT GORDON'S INSTITUTE OF TECHNOLOGY
SCHOOL OF MECHANICAL AND OFF-SHORE ENGINEERING
LECTURERS
In Mechanical and Production Engineering and Mechanical and Offshore Engineering with honours degree and industrial or research experience.

FOR OVERSEAS APPOINTMENTS
Please see Pages 2 and 14
Application forms are available from the Sector Tutor, The Rapid Health College, Thirton House, London SW19 4DB.